November 6, 1950

STEEL

The Magazine of Metalworking and Metalproducing

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OF MICHIGAN
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nding Machines
W Drawing Machines
olling Mill Rolls

Around the Globe

with AETNA-STANDARD

• Wherever around the globe your company may be contemplating expansion, or building for manufacture or processing of ferrous or non-ferrous products, Aetna-Standard can assist.

Aetna-Standard has a world-wide export organization to serve your particular interests in the United States, Canada and abroad. Like our plants in Ohio and Pennsylvania, we specialize abroad in pipe and tube mills, drawbenches, flat rolled equipment, wire drawing machines and other products.

In the event your company contemplates any industrial programs abroad, Aetna-Standard can be of assistance. Write direct to us in Youngstown, Ohio, U. S. A., if your country is not listed below.

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Head Wrightson Machine Company, Ltd., Middlesbrough, England—Great Britain, Finland, Sweden, Norway, Denmark, Union of South Africa, Northern and Southern Rhodesia.

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Plants in Warren, Ohio · Ellwood City, Pennsylvania

Designers and Builders to the Ferrous, Non-Ferrous, Leather and Rubber Industries

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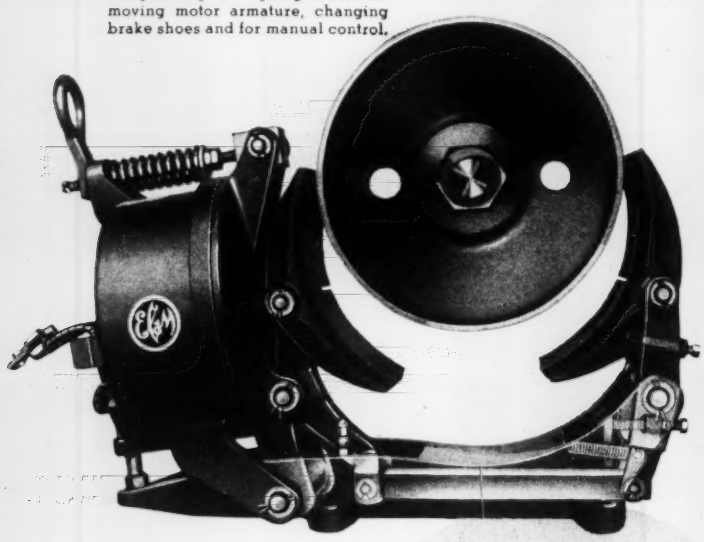
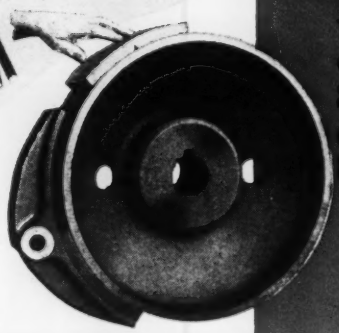
Type WB Brake showing how the motor armature is easily lifted out. At top left is the handle-nut for compressing the spring when removing motor armature, changing brake shoes and for manual control.



Long Life Brakes for A-C and D-C Motors by EC&M

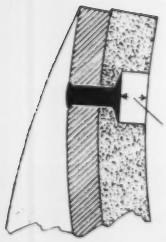


The brake lining is molded to match curvature of wheel and shoe.

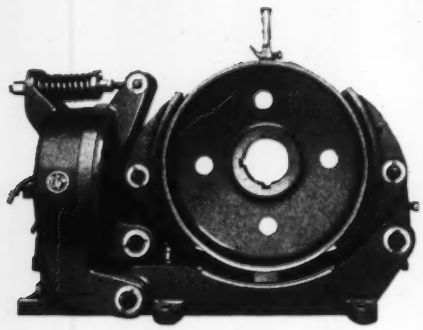
These Type WB Brakes for a.c. and d.c. service have a block type lining which is both thick and tough.

Furthermore, due to the process of manufacture, the blocks have proper frictional quality *throughout the entire thickness* permitting uniform and complete wear down to rivet heads. And since the material is non-compressionable, brake adjustments are infrequent.

EC&M Type WB Brakes are built in several sizes. They can be supplied with series or shunt-wound operating coils for direct current motors. On alternating current service, they are supplied in shunt-wound form for use with a compact rectifier - unit. Send for Bulletins 1004 and 1006 describing these long life brakes.



Actual wearing thickness, between rivet heads and brake wheel, is $\frac{1}{4}$" on the smallest size to $\frac{7}{16}$" on the largest size.



The BIG No. 60 Type WB Brake. The standard claw-hammer resting on the brake wheel gives a comparison of size.

THE ELECTRIC CONTROLLER & MFG. CO.

2698 EAST 79TH STREET • CLEVELAND 4, OHIO

WHY guess about wire rope selection?

GET the right wire rope for each job!

You get better service when you order the right rope from

the thousand and one wire ropes made by **MACWHYTE**

A Macwhyte representative will gladly supply you with specifications for the correct rope to use on each machine you have. Call your Macwhyte distributor, or write direct to Macwhyte Company for recommendations. Catalog on request.

MACWHYTE COMPANY 2912 Fourteenth Avenue, Kenosha, Wisconsin. Manufacturers of Monarch Whyte Strand PREformed, Internally Lubricated Wire Rope, ATLAS Braided Wire Rope Slings, Aircraft Cables and Assemblies, Monel Metal and Stainless Steel Wire Rope. Mill Depots: New York • Pittsburgh • Chicago • Minneapolis • Fort Worth • Portland • Seattle • San Francisco • Los Angeles

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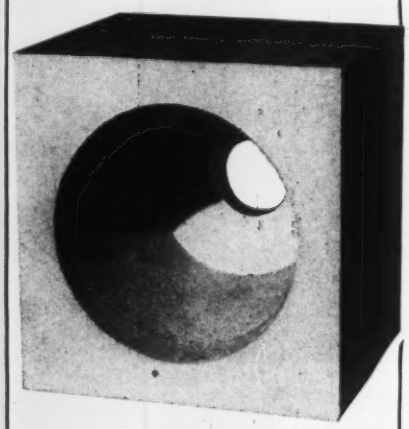
MUL-8

A quality Mullite Refractory

Mul-8 contains a high percentage of Crystalline Mullite. Crystalline content has long been recognized as a controlling factor in the performance of mullite refractories.

PYROMETRIC CONE EQUIVALENT #38



BURNER BLOCKS and other shapes made to your specifications.

Standard shapes carried in stock.

Special shapes made to your specifications.

Dependable Refractories

REMMEY

RICHARD C. REMMEY SON CO.
Philadelphia 37, Pennsylvania

Behind the Scenes . . .

Fall Outfit

Have you noticed the new fall outfit the production-engineering section has been sporting since Oct. 23? The editors have modified headline sizes and spruced layouts to give you better appearance and readability.

"Production and Engineering News at a Glance," the summary department that leads off the production-engineering section and this week is on page 83, has been toned up with a slightly different format to help you get the high spots of technical developments more easily.

The department had its beginnings as "Engineering News at a Glance" back in July, 1946. As its scope broadened, the "production" was added, about a year ago. Engineering Editor Jay DeEulis is proprietor of the page.

Jay, by the way, is the first member of STEEL's editorial staff to be recalled into the armed services. He was in the Navy in World War II, joined the organized reserves after the war and will return to active duty Dec. 1.

The Winner

Our discussion of Oct. 16 about names that lead and end telephone directories has brought in supplemental data. We said Herbert Aa, whom we found heading the personal names in the Brooklyn, N. Y., directory, would be difficult to displace from first place anywhere in the country. He hasn't been yet, as far as we know. But our nominee for last place, John Zyzneski, is routed. H. Clive Morrison of Milwaukee says that one Ziggie Zzyx in the beer city's book should win. Agreed?

Ad Cartoons

The cartoonists, we note, are doing right well by our industrial advertisers these days. When we went to press, not all the ads were in yet, but of those that were we were struck by the artwork, layouts and copy in the pages for Crucible Steel Co. of America, Stalwart Rubber Co. and J. E. Baker Co.

Crucible's stylized figures caught our eye on page 45. We sympathize with Crucible's man in his parking predicament. Also with the man whose problem is presented by Stalwart Rubber on page 105.

We like, too, the giraffes in the Baker ad on page 122. We're a soft touch when it comes to animals.

Red Face

At the latest count, 197 individuals have phoned, written or told us of the typographical error that got by Oct. 23. The company whose name we garbled, Blaw-Knox Co. (steady there, typesetters), hasn't said a word. So we tip our hat to Blaw-Knox, Blaw-Knox, Blaw-Knox.

Up in the Air

To keep abreast of meetings and exhibitions put on by metalworking associations, the editors periodically send out questionnaires to trade groups asking about their convention plans. This answer came back from one outfit: "The next meeting of the association is scheduled for January, but we will not know the place and the exact date until that meeting has occurred."

Puzzle Corner

Our farmer friend of Oct. 23 got his trench dug for $186.60 by digging 71.25 feet along the left border and then 57.68 feet diagonally to the lower right corner of the field. First in with the answer were Charles H. Manning of Bethlehem Steel Co., E. Buschow of Surface Combustion Corp., C. E. Norton of Highland Park, Ill., D. V. Hamilton of Chromium Mining & Smelting Corp. Ltd., M. S. Bailey of Machine Products Corp., Laurence W. Davis of U.S. Army Corps of Engineers, A. W. Everest of General Electric Co., Robert G. Docherty of Midwest Piping & Supply Co. Inc., C. E. Blass of Talon Inc. and T. S. Bean of Barber & Ross Co.

M. S. Bailey submits this puzzle. A bookie at a race track has posted these odds in a race with four entries: One-Hop, even money; Stuck-in-the-Mud, 2 to 1; Slow Motion 5 to 1. What odds should he post on the fourth entry, Left-at-the-Post, to yield himself a profit of 10 per cent of the total bets placed and in what proportions must bets be taken on each horse?

Shrdlu

(Editorial Index—page 47)

Published every Monday by the Penton Publishing Company, Penton Building, Cleveland 13, Ohio. Subscription in the United States and possessions, Canada, Mexico, Cuba, Central and South America, one year $10; two years $15; all other countries, one year $18. Entered as second class matter at the postoffice at Cleveland, under the Act of March 3, 1879.

Expense Account
Date
At Myron Iron Works
5/1/50 Got featured across to Plant Mgr
P.A. was enthusiastic
Pres. now knows our story
At Whale Scale Co.
5/1/50 Good session with foreman
Opened eyes of designer
V.P. expressed interest
Treasurer now knows our values
At Rotor Motor Co.
5/1/50 P.A. now recognizes our superiority
Got safety engineer on our side
Supt. now knows what we offer
Maintenance engineer sees advantages

1. *is false* because this member of your sales team makes far more calls per day than this report indicates.

2. *is false* because this member of your sales team makes *effective* sales calls at far less than 10c per call . . . the estimated average cost of getting a businessman to read most of an industrial advertisement.

3. *is true* because this member of your sales team is *business paper advertising* . . . which is never an expense when it's good; but, one of the wisest investments you can make.

What is Good Business Paper Advertising?

Business paper advertising is good when it shoots at and hits a specific objective. Such objectives include: creating leads for salesmen; pulling inquiries for catalogs or other literature; associating your name with a product or benefit; building greater acceptance for your product; educating prospects on the extent of your line, etc.

For example: A manufacturer of a wide line of forged metal products used to feature one item at a time in small-space advertisements. His new advertising agency recommended larger-space advertisements focusing major attention on one leader. The campaign dramatized an exclusive feature in such a way that mill supply salesmen could build a simple demonstration around the idea.

Results Surpassed All Expectations:

Sales of the featured item increased 400%; total industrial business rose 32%; sales of marine items, which were not even mentioned in advertising, climbed 14% . . . *all in 6 months.*

Salesmanship alone could not have accomplished such results, this now-enthusiastic advertiser agrees. Industrial advertising by dramatizing an exclusive feature opened doors for salesmen and inspired sales demonstrations. Just another proof that *continuous* advertising and *persistent* salesmanship make an unbeatable sales team.

• *This message—one of a series by members of the National Industrial Advertisers Association—is published by* STEEL *to create a wider understanding of industrial advertising and the contribution it is making to American industry. Reprints of this message are available in limited quantities. Address:* STEEL, *Readers Service Dept., Penton Building, Cleveland 13, Ohio.*

Technical Advertising Association of Boston

A CHAPTER OF THE NATIONAL INDUSTRIAL ADVERTISERS ASSOCIATION

A national organization, comprised of 3,500 members of the 34 local associations of industrial advertising and sales executives—dedicated to greater efficiency in industrial distribution—and lower sales cost.

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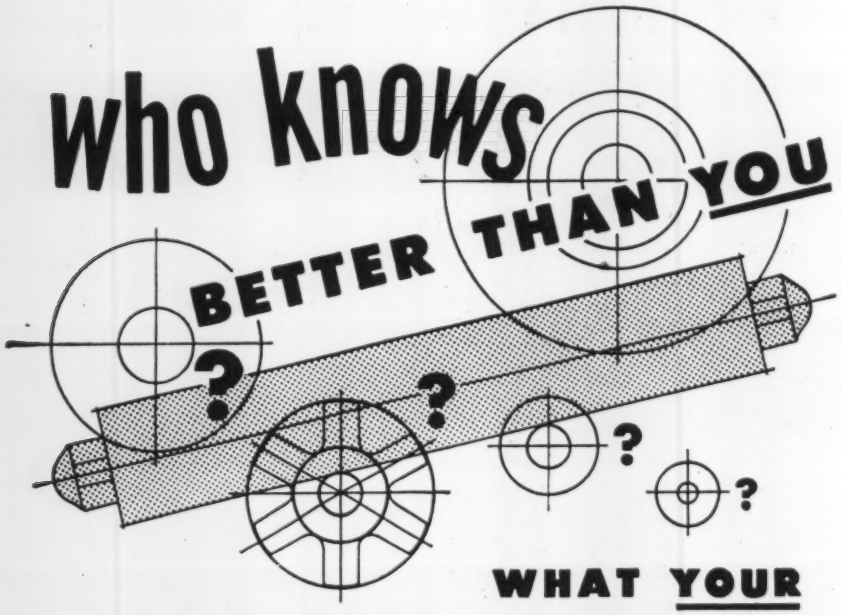
Who knows BETTER THAN YOU



WHAT YOUR ROLL REQUIREMENTS ARE?

When your roll requirements can be satisfied by rolls built to liberal tolerances you don't want the expense of dimensions held to a "tenth" . . . and when you must have rolls with critical tolerances around that "tenth" you can't afford *not* to get that precision . . . *the first time!*

That's where Gorham rolls fit into your picture. We're completely equipped and qualified to fill your requirements in cold mill rolls, including working rolls, intermediate rolls, drive rolls and specials. *Your* specifications run the show. When you want ordinary commercial tolerances, that's what you get . . . and when you require extremely close tolerances, our experience, equipment and skilled personnel assure you precision, right on the "tenth".

Gorham rolls are manufactured from the steel best suited to your job, properly heat treated for correct hardness and wear resistance and ground to the dimensions and finish *you* specify. We furnish a wide variety—from small rolls for the smallest Sendzimir precision strip mill up to rolls 14 inch diameter, 6 feet long. Gorham field service engineers, who can give you valuable assistance, are conveniently located in principal industrial centers.

We invite you to join the list of operators *and* manufacturers of rolling mills whom we now serve. You'll find us a convenient and cooperative source for your roll requirements. Send us details of your rolling problems for recommendations, or your roll specifications for a prompt quotation.

Gorham TOOL COMPANY

14401 WOODROW WILSON • DETROIT 3, MICHIGAN

LETTERS
TO THE EDITORS

With the Fringe on Top

In the Oct. 16 issue, on page 71, you have an article about wages for payrolls in the steel industry for August. It quoted 1.717 as the hourly pay work and tonnage average for steel workers. Can you tell us whether this includes fringe issues and what these might be.

E. H. Branning, General Manager
Wood Shovel & Tool Co., Piqua, O.

• *Payments referred to include hourly wage rate, plus overtime payments, if any. They do not include pensions, insurance, paid holidays, social security or any of the so-called fringe benefits. These vary from company to company; hence it would be difficult to determine the cost to the industry.*

Re: Steel Statistics

In the Jan. 3, 1944, issue of STEEL you published a section headed, "The Statistical Position of the Steel Industry." In it was the steel producing capacity of each plant in the United States. Can you tell me where I may obtain more up-to-date figures.

George V. Campbell, Sales Manager
Ramtite Co., Chicago, Ill.

• *STEEL summarized the statistical position of the steel industry in the issue of Nov. 29, 1948; however, this gave steel production capacities by companies, not by individual plants. Figures for each plant may be found in the "Directory of Iron and Steel Works of the United States and Canada, 1948," published by American Iron & Steel Institute, 350 Fifth Ave., New York 1, N. Y. There have been some capacity changes since its publication, but a new edition will not be available until next year.*

Queue Up for Your Steel

We are writing you in hope that you may be able to help us find a user for a steel item we are able to supply. This item is 15/16-inch x 20 gage hot rolled steel strip. It will have various degrees of surface rust, but not enough to affect the strength of the metal.

We are able to offer it in a steady supply at approximately mill prices in lengths up to 4 feet. We will send samples to any interested companies.

A. E. Witten
Witten Iron & Metal Co., Gastonia, N. C.

In Charge of Bars and Rods

On page 51 of your Oct. 9 issue you refer to the NPA (National Production Authority) Steel Products Advisory Committee. We would appreciate the committee address and individual in charge of hot-rolled bars and rods.

H. O. Hanson, Research Parts & Engineering Corp., Green Bay, Wis.

• *Committee is made up of sales vice presidents or general sales managers of leading steel producers, serving in an advisory capacity. Address is National Production Authority, United States Department of Commerce, Washington 25, D. C. D. B. Carson, Sharon Steel Corp. vice president, is director of Iron and Steel Division, NPA. Personnel organization is proceeding as rapidly as security checks can be completed.*

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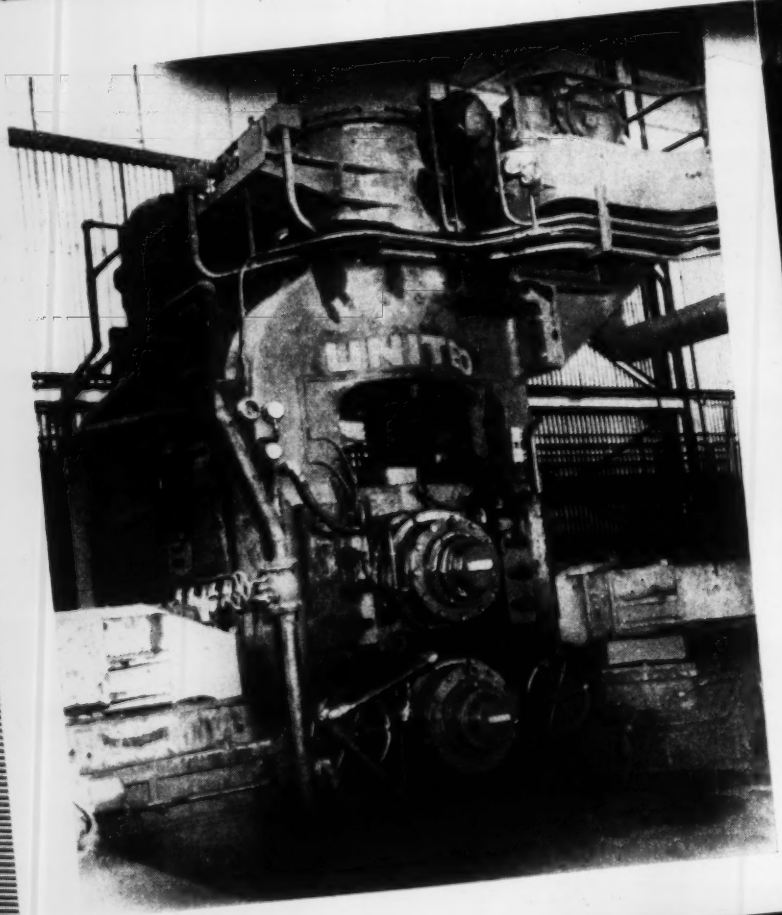
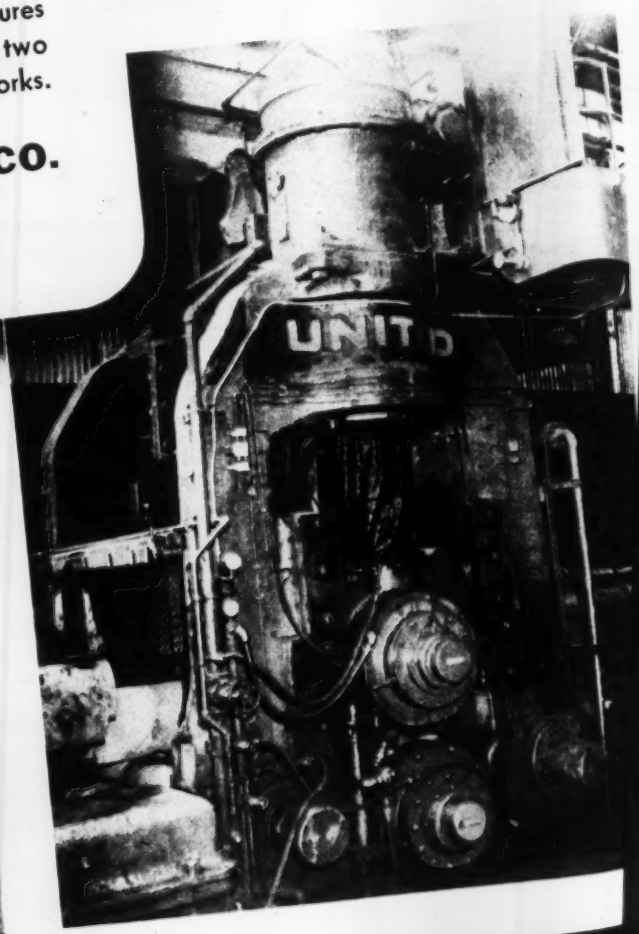
ON BLOOMING MILLS TOO

. . . Morgoil Bearings are setting new records for efficiency and economy of operation. These pictures show a very satisfactory Morgoil installation in two mills of the National Tube Company—Lorain Works.

MORGAN CONSTRUCTION CO.
WORCESTER, MASSACHUSETTS
English Representative: International Construction Company
56 Kingsway, London, W.C. 2, England

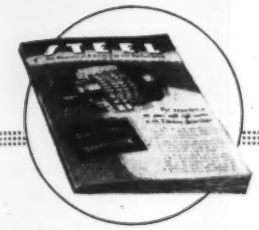
MB-15





MORGAN
WORCESTER
ROLLING MILLS
MORGOIL BEARINGS
WIRE MILLS - GAS PRODUCERS - AIR EJECTORS
REGENERATIVE FURNACE CONTROL

MORGOIL
ROLL NECK BEARINGS



November 6, 1950

Tomorrow's Elections

Among the hotel corridor discussions of the current convention season was one in which an astute student of political and economic affairs was trying to make the point that industrial leaders should not be too much concerned as to how tomorrow's elections turn out. His argument was that business has managed to function effectively no matter which major party has been in power. Why get too excited about the outcome?

Possibly this complacent attitude could be condoned if we were certain that our traditional two-party system—as we have known it during the past half-century—would continue without major change. There have been many instances where the impact upon industry resulting from a shift in power from one party to the other has been relatively slight. Pertinent questions of the moment are (1) will this impact continue to be light and endurable and (2) will our two-party system survive in its present form?

Certain aspects of the current political campaigns raise grave doubts as to the answers to both questions. We have witnessed the odd spectacle of a union minority group practically taking over the Democratic party for the purpose of waging the campaigns in certain areas. The tactics are patterned after Communist techniques. The objectives of the leaders of these campaigns resemble closely the avowed aims of the Labor government in Britain.

Last week the King of England read his official message in which he announced that certain far-reaching emergency controls would be made permanent and that the government would extend its already ambitious nationalization program. This is almost tantamount to saying that the government intends to further entrench its power to the point where future retreat from a total planned economy will be made extremely difficult if not hopeless.

Unfortunately we are far along the road to Britain's sad predicament. The outcome of tomorrow's elections will be particularly significant because it will show whether the drift toward socialism is to be checked or whether it is to be accelerated.

Unless it is checked and eventually reversed, our beneficial two-party system will be endangered and the impact of politics upon business will become far more violent than at any time in the past.

* * *

HISTORY WILL DECIDE: Eyebrows were lifted when Charles E. Wilson, president of General Motors, in off-the-cuff remarks in Chicago, gently chided the steel industry for failure to "go ahead with the country."

That his taunt was more cutting than intended is proved by his considered statements on other occasions. Last August Walter Reuther of UAW-CIO wrote presidents of all automobile companies proposing a conference to find means of "forcing" the steel industry to increase capacity. Mr. Wilson replied: "I am sure you recognize, as I do, that the problems of other industries are not necessarily similar to those in the automobile industry. . . ." In the Chicago meeting Mr. Wilson took pains to explain that the steel industry is not as flexible, in expansion, as are the industries which consume steel in quantity. Also, unknown to most persons disturbed by Mr. Wilson's remarks, is the fact that at a banquet on the eve of his attack, he admitted ruefully that he had been guilty of underestimating the potential of the automotive industry. He stated that years ago, when pressed

(OVER)

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for an estimate on ultimate automobile output, he ventured the conviction that someday the industry might get up to a peak of 3 million cars a year. Actually production this year will approximate 8 million cars and trucks.

Under today's extraordinary conditions, any statement that an industry—steel, automotive or other—is missing the boat is a matter of opinion. Time and circumstances will prove whether or not Mr. Wilson's playful jibe was justified.

—p. 69

* * *

HOW MUCH CAPACITY?: Evidence is mounting to indicate that the figure of 110 million tons of steel ingot capacity tentatively set as a goal to be reached in 1952 will be exceeded. Irving S. Olds, chairman of United States Steel, reported last week that a number of producers are considering expansions that will raise capacity beyond 110 million tons. Earle S. Smith, chief metallurgist of Republic Steel Corp. forecasts a capacity of 125 million tons by 1970.

Of course nobody can say with certainty what the ceiling of steel capacity will be at any given future date. Current circumstances argue for more capacity at earlier dates than had been anticipated before the Korean attack. Future events easily could either speed or tone down present plans for expansion. —p. 55

* * *

HIGHER PER CAPITA: In 1943 we produced 88.8 million tons of steel ingots. This output supported our armed forces and supplied war needs of other nations, including Russia. In 1950 we will produce 95 million tons. Where is it going?

We manufactured fewer than a million autos and trucks in 1943; this year the total will exceed 8 million. In 1943 home construction was limited; in 1950 more than a million homes are being started and on the average each takes 4.5 tons of steel. In 1943 about 150,000 refrigerators were manufactured; in 1950 the total will exceed 6 million. No television sets were manufactured in 1943; an estimated 6.7 million will be turned out this year.

A rapidly increasing army of gainfully employed workers who are also consumers, demands more of the accepted requisites of a higher standard of living. Translated simply, this means a higher per capita consumption of steel. —p. 66

"BIGS" NEED "SMALLS": When Sen. Robert A. Taft told members of the National Tool & Die Manufacturers Association at their fifth annual meeting in Cleveland last week that they personified "American small business and energetic private enterprise," he was paying them a richly deserved compliment.

Here is an industry of about 2500 small shops. The typical shop employs from 15 to 64 persons. Total employment for the industry is about 45,000—an average of 18 per plant. These highly skilled craftsmen produce basic tooling for the benefit of the large mass production industries at the rate of about $325 million annually. This means that the average annual volume of business per shop is $142,000.

These figures of average employment and average volume of business seem modest in comparison with the acknowledged importance of tool and die work to the successful operation of some of America's largest industries. Perhaps they demonstrate that the "bigs" need the "smalls" and the "smalls" need the "bigs."

—pp. 58, 87

* * *

MILLING AND HANDLING: In recent years there has been a noticeable trend in extending mechanized materials handling from production line conveyors right into machine tools. This permits a co-ordination of "external" and "internal" conveying systems and in mass production industries it counteracts high labor costs to a considerable degree.

An example of this marriage of machine tool and materials handling is provided by a duplex transfer milling machine built by Cincinnati Milling Machine Co. It is designed to rough and finish mill both ends of cast iron motor truck clutch housings. A rough casting enters the work tunnel of the machine at station No. 1, is automatically conveyed to station No. 2 where it is rough milled, is conveyed to station No. 3 where it is finish milled and is pushed on to station No. 4 for unloading. As this is going on other castings follow the first in succession. Feeds and speeds and movement of heads and conveyors permit an output of 69 clutch housings per hour. —p. 85

E. L. Shaner

EDITOR-IN-CHIEF

News Summary

ALLOCATIONS PARADE— The shape of things to come in steel distribution: More and more allocations programs to whittle away at the available free steel. Two of the latest government-directed programs may require as much as 2,050,000 more tons of steel than they are taking in 1950 (p. 55). A petroleum program—for oil drilling rigs, processing equipment and for transportation—will require about 12 million tons, 2 million more than needed now. About 50,000 tons will be allocated next year for construction of seven ore carriers. Other allocation programs pending are for inland waterways barges and towboats, trucks, power expansion and many others.

BIGGER AND BIGGER—While allocations may complicate your steel procurement problems, steel industry expansions will help them—in the long run. Capacity will jump to 110 million ingot tons by 1952 and to 125 million tons by 1970, predicts Earle C. Smith, chief metallurgist of Republic Steel Corp. (p. 55). . . . Better able to participate in that industry expansion will be Kaiser Steel Corp. which through new private financing has finally cleared up its $91.2 million loan from the RFC. It can now go full speed ahead on an expansion program at Fontana, Calif., to cost at least $24.5 million.

PROTEST— Some spokesmen for metalworking are saying that steel men underestimated postwar steel demand (p. 69). General Motors' C. E. Wilson says steel people were overly conservative in figuring the rising need for steel through improving technology and increasing population.

LARGER BUDGET—Steel users are in the position of a man with a larger income now than in 1943 but who is having as much or more trouble today making ends meet (p. 66). In 1943 we fought a war on a steel income of 88.8 million ingot tons. This year we're having difficulties in at least a half-peace economy on a steel income of about 95 million tons. Why? Because in 1943 only 965,000 cars and trucks were assembled, only 140,000 new houses were started and scarcely no home appliances were built. Now, heavy steel-consuming industries are building cars and trucks at the rate of 8 million a year, new houses at a pace of 1.2 million a year and refrigerators at the rate of 6.3 million a year.

MORE MONEY—Resign yourself to steel price increases (p. 56). Steel company officials are cushioning the shock of the inevitable boost by citing figures and giving warnings in advance. Raw material price rises since June 1 have boosted steelmaking costs by $3.50 a ton, U. S. Steel Corp. Chairman Irving S. Olds points out. Armco President W. W. Sebald says the industry would be justified in increasing steel prices $5 an ingot ton right now regardless of the outcome of current wage negotiations.

MORE TAXES—Higher federal taxes and rising steelmaking costs took a 4 per cent bite out of steel company earnings in the third quarter, compared with the second (p. 59). Twenty-one companies representing 84 per cent of the nation's ingot capacity had a profit of $180,861,719 in the third quarter, compared with $189,413,319 in the second.

MORE BUSINESS—The nation's industry continues at a break-neck production pace (pp. 72-75). STEEL's index holds at the alltime high of 222; the ingot rate fell to 98.5 per cent of capacity, chiefly because of a wildcat strike at Bethlehem's Lackawanna, N. Y., plant; weekly auto production is sailing along at about 185,000 assemblies a week. The FRB index skipped to 211 per cent of the 1935-1939 average in September and will be even higher in October. Both the wholesale and consumer price indexes moved higher in September and fell only a little short of the alltime highs.

HERE AND THERE IN INDUSTRY—The 152 companies that replied to a Congressional committee questionnaire on lobbying say they spent $32,124,800 from Jan. 1, 1947, to June 1, 1950, on activities "relating to attempts to influence legislation" (p. 62) . . . The problem of price equalization is the main stumbling block in implementing the Schuman plan to pool operations of European steel and coal producers (p. 65).

NEWS SUMMARY
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RYERSON STEELGRAMS

This bulletin is written to keep you abreast of the warehouse steel situation as we see it here at the Ryerson Company. We hope you will find this summary helpful in specifying, buying and working with steel.

If you have orders with DO Priority Ratings be sure to pass ratings along to your steel supplier. This will not only expedite delivery of steel but may also help warehouses maintain inventories against your future demands. Depleted warehouse stocks of 1942 emphasize importance of working for continuous replenishment.

New loan guarantees, recently announced by the Federal Reserve are helping many small manufacturers with defense contracts. Similar to World War II V-Loan program, the new set-up provides such manufacturers with easier access to working capital.

Despite restrictions on nickel, you will still be able to obtain alloy steel of comparable performance containing other alloying elements. As warehouse stocks of nickel alloys are depleted, triple alloys, which proved their worth in World War II, will take their place. Cost — slightly less.

A word about telephone service — A tremendous number of incoming calls is taxing the capacity of our personnel and switchboards, and even of whole exchanges that serve our plants. What we are doing about it: Improved facilities are now being installed or planned for where needed. Suggested emergency measures: early calls before peak loads; telegraph; mail, which most Ryerson plants pick up hourly at P. O. for quicker service.

Improved outlook — Building for the future, the Ryerson Chicago plant is being extensively rebuilt and enlarged. In Cincinnati — a completely new Ryerson plant at new location soon to be in operation. At Philadelphia — a new mill-type slitting line gives quick service on strip steel of any width up to 48".

New machinability records for alloy steel are being set by Ryerson Rycut — a free-machining medium-carbon alloy. Shop experience shows that Rycut machines 25% to 50% faster than standard alloys of same type, annealed or heat treated.

Shortages of some products such as bars, shapes, plates and sheets are inevitable. But many others are in good supply at Ryerson. Among them:

Tubing — Good tonnage of both seamless and welded mechanical tubing is on hand and new stock is coming in regularly. So while we may be short of a few sizes one week, they may be available the next.

Inland 4-Way Safety Plate — Large and medium patterns in a good range of sizes available for those who need material combining a sure-traction surface with strength, durability and fire-safety.

Also quickly available from Ryerson: Forgings, cold drawn special shapes, tool steel, drill rod, chain, wire rope, expanded metal, Babbitt metal.

Joseph T. Ryerson & Son, Inc. Steel-service plants at: New York, Boston, Philadelphia, Detroit, Cincinnati, Cleveland, Pittsburgh, Buffalo, Chicago, Milwaukee, St. Louis, Los Angeles and San Francisco.

Advertisement

STEEL
A PENTON PUBLICATION

Oil, Ore Boats To Get More Steel

Petroleum program may take 12 million tons in 1951, 2 million more than it now requires. Some strip mills will roll freight car plates

TWO more government-directed programs calling for steel allocations are shaping up in Washington. They may require as much as 2,050,000 more tons of steel next year than they are taking in 1950.

The petroleum program—for oil drilling rigs, processing equipment and for transportation—will require about 12 million tons in 1951 on the basis of estimates by the Petroleum Administration for Defense. This is 2 million tons more than the industry is getting currently. These are preliminary figures and do not necessarily mean that the petroleum industry will be allocated that much steel.

Steel for Freighters—More certain is the allocation of 50,000 tons of finished steel products for the construction of seven lake ore carriers. These vessels will carry a high priority as the industry is agreed that additional vessel capacity will be necessary to carry raw materials to an expanding steel industry. Contracts for the freighters already have been let.

Programs To Come—Estimates as to the steel to be required for inland waterway barges and towboats cannot be made yet. The Defense Transport Administration is now getting out a questionnaire to the 140 builders of inland waterway craft to ascertain how many vessels are on order, how much steel they will require, by products, to build these craft. Replies will help formulate the inland waterway program.

The agenda of the Defense Transport Administration calls as well for studies of steel requirements for motor trucks, railroad track, bridges and buildings and for locomotives. They are waiting in line for action.

Rocks in the Path—The mining industry expansion authorized by Congress in the Defense Production Act has struck a snag. The Minerals & Energy Administration a month ago submitted proposals to the Bureau of Budget for the use of government funds through loans, premium prices and contributions to defray the excess costs of operating marginal properties to increase the output of certain critical minerals. This program is being examined carefully and meanwhile is held up.

Power Program Coming—Defense Power Administration will come up with an electric power expansion program in the next 30 to 60 days. It is unlikely this program will take much steel before the second quarter of 1951.

Some Strip Mill Conversion—Meanwhile, the freight car program is getting underway. While the Iron & Steel Division of National Production Authority has not asked any of the sheet and strip producers to convert their mills to plate production, several of the producers supplying plates will roll them on strip mills. Some producers say that by the end of the year they will increase plate production by 10 to 15 per cent and that this must be at the expense of the lighter flat-rolled products.

They'll Roll the Plates—Thirty-one plate producers will share in the freight car program and will supply 308,466 tons of plates starting Jan. 1. The producers:

Alan Wood, Armco, Atlantic, Bethlehem, Central Iron & Steel, Colorado Fuel & Iron, Continental, Copperweld, Crucible, Detroit Steel, Edgewater Steel, Granite City, Great Lakes, Inland, Jones & Laughlin, Kaiser, Laclede, Lukens, Pacific States, Phoenix Iron & Steel, Pittsburgh, Republic, Sharon, Sheffield, Standard Steel Division of Baldwin Locomotive Works, U. S. Steel, Weirton, Wheeling, Wisconsin, Worth, and Youngstown Sheet & Tube.

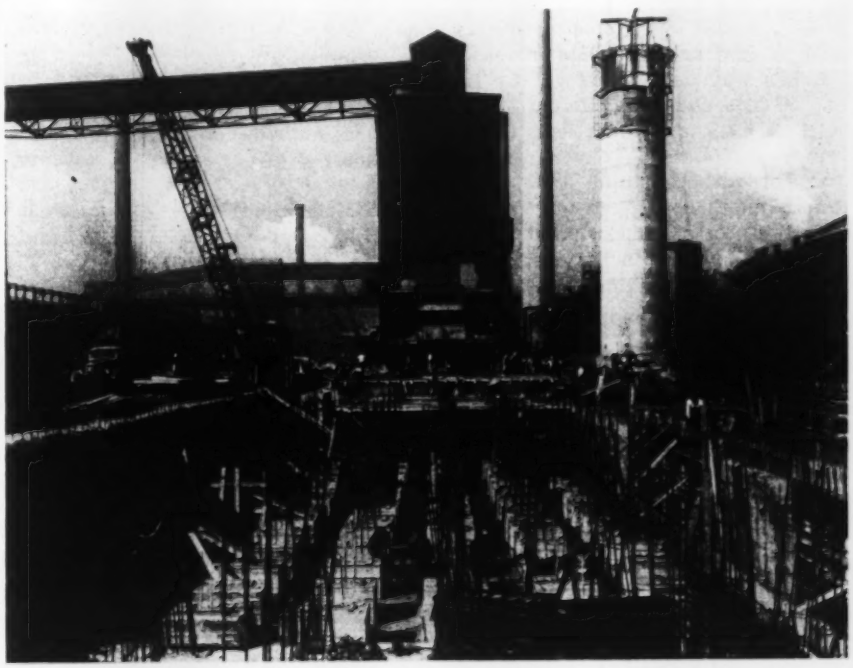
No Ceiling for Steel

Expansion programs under study would lift capacity well above 110 million tons

EXPANSION of the steel industry's ingot producing capacity won't stop at the 110-million-ton mark scheduled to be reached in 1952.

What the ceiling ultimately will be no one knows but various producers are considering expansions which will raise the nation's capacity beyond 110 million tons, Irving S. Olds, chairman, United States Steel Corp., reports.

125 Million by 1970?—A 125-million-ton capacity by 1970 is fore-



LOOKING AHEAD: As part of a nation-wide program of U.S. Steel subsidiaries to increase steel capacity by 1.6 million tons, Carnegie-Illinois Steel Corp., is completing the foundations for a new coke oven battery at Gary Works. The new battery will replace an old one and is expected to produce about 380,000 tons of coke a year, an increase of 40,000 tons annually over the old battery. Coke will be pushed from the ovens about June of next year

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seen by Earle C. Smith, chief metallurgist, Republic Steel Corp., who discussed steel industry expansion at the recent National Metal Congress in Chicago.

Both Mr. Olds and Mr. Smith emphasize that steel industry people are the best equipped to determine how much expansion there should and can be in the steel industry. From other quarters there have come a good many suggestions as to how big the nation's steel capacity should be.

More Than Furnaces Needed — There's more to increasing the country's steel capacity than just building some steel plants. More steelmaking plants require more finishing mills, more pig iron, more ore, more fuel, more of everything. And here's where the problem becomes complex. To get more pig iron you have to build more blast furnaces and increase your coke-making capacity. If you do this you have to find more ore and build more ships to haul it in. Add to this the myriad of other problems, and it all sums up to this: Steel capacity can't be increased at the push of a switch . . . or without dollars, a lot of 'em.

Steel Increase Coming

Wage increase will necessitate higher prices, says producers' spokesman

YOU can count on paying higher prices for steel if the steel producers have to give another wage increase.

Here's why, as pointed out by Irving S. Olds, chairman, United States Steel Corp.: Employment costs represent approximately 42 per cent of that corporation's total costs, with almost another 42 per cent represented in costs of purchased goods and services. Any increase in either means a major cost increase.

Already the steel industry has been hit by price rises on raw materials it buys. Since June 1, copper, heavy fuel oil, scrap, nickel, palm oil, spelter, zinc concentrates, tin, aluminum and refractories, have ascended pricewise, Mr. Olds points out. The increase on these items alone represents to U. S. Steel an advance of $70 million a year, or about $3.50 per ton of steel.

Add a substantial wage increase and an increase in steel prices will be inevitable, Mr. Olds warns.

In agreement with Mr. Old's statement that higher wages will bring higher steel prices is E. G. Grace, chairman, Bethlehem Steel Corp. Both Mr. Olds and Mr. Grace believe a wage increase now is unsound eco-

IRON & STEEL DIVISION

of National Production Authority

Commerce Bldg., Washington 25

Phone STerling 9200—Extensions as Indicated

		ROOM	PHONE
Director	D. B. Carson	3830A	Ext.-4455
	Mary Lou Hanford		-4456
	Glena C. Gerfin		-4346
			-4347
Assistant to Director	F. T. McCue	3323	Ext.-3962
	Margaret F. Sullivan		-2369
	Helen Fentress		-2328
Staff Assistant	J. Levin	3323	Ext.-2273
Staff Assistant	R. X. McGowan	3327	Ext.-3349
Staff Assistant	E. S. Moorhead	3819	Ext.-3483
International Economist	J. J. W. Palmer	3319	Ext.-2263
Staff Economist	R. M. Weidenhammer	3323	Ext.-2214
	Kathleen Cockrum	3329	Ext.-4444
	Dean Peterson	3319	Ext.-3485
	Onie Woods	3329	Ext.-2196
Legal Counsel	R. Bronson	5121	Ext.-4621
SECTIONS			
Stainless Steel	C. B. Boyne, Chief	3827	Ext.-3332
	Dorothy C. Blair		
Pig Iron	J. A. Claussen, Chief	3825	Ext.-2342
Alloy & Cold-Drawn Bar	L. E. Creighton, Chief	3827	Ext.-3333
	G. L. Anderson, Ass't Chief		
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Program	C. Halcomb, Chief	3823	Ext.-3152
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	Frieda Rosoff		Ext.-2363
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			-4437
Priorities & Statistical Control	K. H. Hunter, Chief	3329	Ext.-3974
	Esther F. Brelsford		Ext.-3330
Plant Expansion	H. L. Leyda, Chief	3309	Ext.-3140
	Mary Keach Banks		
Tin Plate	A. M. Long, Chief	3825	Ext.-3334
Structural Shapes	R. A. Marble, Chief	3324	Ext.-2767
			-2988
Wire	N. F. Melville, Chief	3819	Ext.-4656
	Lillian C. Kaschub		
	W. E. Mullestein, Chief	3324	Ext.-2767
Plate	W. E. Bossert, Ass't Chief		-2988
	Constance W. Warner		
Sheet & Strip	W. B. Quail, Chief	3320	Ext.-2529
			-2700
Bars & Semifinished	J. W. Robinson, Chief	3326	Ext.-3310
			-3151
Warehouse	A. Y. Sawyer, Chief	3312	Ext.-2050
	Maxine Dixon		-2681
Forgings	H. F. Weaver, Chief	3310	Ext.-2004
	J. E. Sweeney, Ass't Chief, forgings		-2609
	Clara McPherson		

Castings (yet to be organized and staffed)

MR. CARSON is vice president in charge of sales, Sharon Steel Corp. Mr. McCue is chief, Iron and Steel Division, Department of Commerce; in World War II he served the War Production Board's Steel Division as a steel specialist and before the war was with Carnegie-Illinois Steel Corp. in sales.

Mr. Boyne is from Allegheny Ludlum Steel Corp., Mr. Claussen from the American Iron & Steel Institute, Mr. Creighton from Rotary Electric Steel Co., Mr. Davis from Inland Steel Co., Mr. Happer from National Tube Co., Mr. Leyda from General Steel Co. and Fort Worth Structural Steel Co., Mr. Long from Youngstown Sheet & Tube Co., Mr. Marble from Carnegie-Illinois Steel Corp., Mr. Melville from Pittsburgh Steel Co., Mr. Mullestein from Lukens Steel Co., Mr. Bossert from Alan Wood Steel Co., Mr. Quail from Armco Steel Corp., Mr. Robinson from Jones & Laughlin Steel Corp., Mr. Sawyer from Joseph T. Ryerson & Son Inc., Mr. Weaver from Bethlehem Steel Co., and Mr. Sweeney from Kropp Drop Forge Co.

All others in the NPA Iron & Steel Division staff are civil service employes of the government.

nomically. The cost-of-living index is lower today than it was at the steel wage increase two years ago, Mr. Grace explains. Recent wage increases in other industries, however, represent a certain "practical factor" that undoubtedly has to be considered in current wage negotiations in the steel industry, Mr. Olds says.

—Rise Justified Now—

THE STEEL industry would be justified in increasing steel prices $5 an ingot ton right now, regardless of the outcome of current wage negotiations. This is the opinion of W. W. Sebald, Armco Steel Corp. president. He explained that steel prices have lagged behind other commodities and rising material and production costs make an increase necessary.

Other Armco officials indicated they are expecting an increase around that amount in the near future.

Kaiser Refinances

Pays off government loan on Fontana in full. Opens way for further expansion

THERE was a lot of money changing hands last Wednesday at the offices of the Chase National Bank, 11 Broad St., New York. It marked consummation of what was described as the largest single industrial financing by private funds in the history of the western states, and Kaiser Steel Corp. was the central figure.

Dollars on Parade — The curtain went up as the First Boston Corp., underwriting syndicate manager, delivered net proceeds from the public sale of $40 million worth of stock in Kaiser Steel—1,600,000 shares of $24 cumulative preferred and 800,000 shares of common. Some 234 investment underwriters were in on the deal and the stuff was gobbled up quickly by the public.

Then ten insurance companies turned over to Kaiser Steel $60 million for first mortgage 3¾ per cent bonds, due in 1970. Prudential, Metropolitan Life, New York Life, Mutual Life and Northwestern Mutual Life took the biggest chunks.

Next came the delivery of a six-year bank credit agreement under which Kaiser Steel may borrow up to $25 million. Bank of America, Mellon National Bank and Chase National Bank are the participants.

Henry J. Pays Off—Finally Henry J. Kaiser, with his customary flourish, handed to an RFC official a check for $91,185,990 to pay off in full a government loan on his integrated Fontana, Calif., steel plant, whereupon RFC flashed the word westward to release all government mortgages on Kaiser Steel properties. It might be pointed out here that Henry J.'s Kaiser-Frazer Corp. and dealers are still in hock to the RFC for $44 million, against which are pledged all Kaiser assets in the West.

Green Light For Expansion—So now Kaiser Steel can turn full throttle on its expansion program at Fontana, which will take a minimum of $24.5 million. Included are a tin plate mill with capacity of 200,000 tons a year, an eighth 200-ton open hearth, together with additional soaking pits and blooming facilities to boost steelmaking capacity by 180,000 tons to a total of 1,380,000 tons annually.

Built originally in wartime, with considerable help from established steel producers, Fontana could roll only plates, structural shapes and shell billets. Now it supplies merchant mill products, skelp, hot-rolled and cold-rolled strip and sheet, continuous weld small diameter pipe, electric weld line pipe and large diameter expanded pipe for gas lines. That took $56 million in additional equipment — another blast furnace, open hearth, 45 coke ovens, more roll stands and tables, not to mention a 52-mile private railroad to tap Eagle Mountain's ore. In Utah more coal properties were purchased, with estimated reserve of 100 million tons of high-volatile coking coal, enough to keep Fontana going for 68 years.

Kaiser says the government has realized a return of $1.23 for each dollar of its war loan to build Fontana—the complete principal and better than $22.9 million interest.

Carnegie Unveils New Alloy

Carnegie-Illinois Steel Corp. is formally announcing the first of a new group of alloy steels to be known as T-steels. Carilloy T1 is a multiple-alloy plate steel which combines high strength, ductility and toughness, even at subzero temperatures. (STEEL, Aug. 7, p. 61).

Carnegie started development of the T alloys more than four years ago. Recently large commercial heats were made and the steel underwent practical tests.

The company says the new steel has almost double the strength of the high-strength, low-alloy steel and almost triple that of ordinary welding grade structural steels. The plate steel is supplied precision heat treated to a minimum yield strength of 100,000 psi. It is designed for such applications as construction of ships, heavy mobile equipment, earth moving and surface mining machinery.

Experiments indicate that welding does not adversely affect the steel's properties. No special equipment is required for welding or fabrication, says Carnegie.

The steel is produced in standard open-hearth furnaces. Its strength is drawn from a comparatively large number of alloying elements that are readily available.

CIO Defeated at Weirton

United Steelworkers - CIO was soundly defeated in a collective bargaining representation election at Weirton Steel Co. Of 10,832 valid votes, 7291 were cast for the Independent Steelworkers Union and 3554 for the CIO union.

The ISU was organized four months ago when the Weirton Independent Union was dissolved by order of the United States Third Circuit Court of Appeals which held the union was company dominated.

Cladmetals Installing Cold Mill

To integrate all of its operations at its Carnegie, Pa., plant, American Cladmetals will complete installation there of a 30-inch wide cold reduction mill stand, Joseph Kinney Jr., president, announces.

The mill was bought from Jones & Laughlin Steel Corp. and was last in operation at J & L's Otis Works in Cleveland. Auxiliary finishing and automatic handling equipment will be installed with the mill which was designed and built by Mesta Machine Co., Pittsburgh. The mill will be used for the processing of products used in the manufacture of cooking utensils. It will be suitable, too, for production of cladmetal used for ammunition components and silver cladmetal bearings.

Coke Ovens for Sloss-Sheffield

Contract for construction of a 30-oven coke battery was awarded to Koppers Co. Inc., Pittsburgh, by Sloss-Sheffield Steel & Iron Co., Birmingham. Cost of the new ovens will be about $2 million.

Sloss-Sheffield now has two batteries of 30 ovens each at its Birmingham plant. The new Koppers ovens will raise the total to 150 and raise the coal carbonizing capacity to 3280 net tons daily from the present 2700 tons. Work on the new ovens will start immediately and will be pushed to completion as rapidly as possible.

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Small Business and War

Tool and die manufacturers study their place in the garrison state at Cleveland meeting

WHAT steps can small business, and particularly the tool and die shops, take to help the nation and themselves in this period of fractional war economy?

This was a foremost question in the minds of the 200 delegates attending the fifth national membership meeting of National Tool & Die Manufacturers Association in Cleveland Oct. 29-Nov. 1.

This group of industries tools up the machines which mass produce all kinds of metal products. It already is beset by shortages in materials and manpower. It is a basic factor in the armament program, as well as the civilian economy.

Typical Small Business—Sen. Robert A. Taft (Rep. O.) lauded the group as the personification of American "small" business and energetic private enterprise.

$325 Million Industry—Centre W. Holmberg, retiring NTDMA president, pointed out that the majority of the audience consisted of men who own tool and die shops employing from 15 to 64 people. There are about 2500 such shops in the United States employing in all 45,000 highly skilled craftsmen and currently producing basic tooling at the rate of $325 million per year for the benefit of mass production industries.

Manpower: No. 1 Shortage—The manpower shortage was stressed by Col. Joel D. Griffing, chief of manpower division, Selective Service System, Washington. Colonel Griffing holds no great hope for widespread deferments in the group under 26 years of age. He urged the tool and die executives to limit exemption claims to only the most deserving cases and to follow those through with logic and vigor. Even in such cases he recommended that replacements be trained as soon as possible.

Best advice George A. Moore, Cleveland regional director, Department of Commerce, offered on orders and allocations was to avoid going to Washington if possible. A synopsis of bids on defense work are available at regional offices throughout the country and small business men do not need to resort to "five-percenters" to get this business.

Beat the Wage Freeze—Tool and die shops should immediately get their wage structures up-to-date ahead of impending wage and salary freezes, said Chester Nikodym, Cleveland labor consultant. He suggested one method to stop skilled labor piracy is through co-operation with newspaper publishers—the end being voluntary restriction on certain types of "want-ads" run by nonessential companies.

Reserve Tools Demothballed—Many of the 98,000 reserve industrial machines—of which 60 per cent are machine tools, now are being "taken out of the moth balls," J. H. Williams, Munitions Board said. A new method makes it possible to "degunk" a machine tool in about seven minutes. Previously considerable trouble had been experienced in cleaning the preservative off the stored machines.

New officers of the association are: President, Herbert F. Jahn, president of B. Jahn Mfg. Co., New Britain, Conn.; first vice president, R. H. Cope, comptroller, Bunell Machine & Tool Co., Cleveland; second vice president, Alfred Reinke, president of Gus Reinke Machinery & Tool Co., Hillside, N. J.; and secretary, Herbert C. Murrer, Murrer Tool Co., Cincinnati. Herbert Harig, who is vice president of Harig Machinery Co. of Chicago, was re-elected treasurer, and George S. Eaton was re-elected executive secretary with headquarters in Union Commerce building, Cleveland.

HERBERT F. JAHN
NTDMA President

The 1951 annual meeting will be held in St. Louis.

ASTE Charters 86th Chapter

Its 86th chapter was chartered this month by the American Society of Tool Engineers at Dover, N. H., at a meeting of 57 charter members. Elected at the meeting were: Chairman, John A. Woodman, mechanical superintendent, General Electric Co., Somersworth, N. H., plant; first vice chairman, Walter H. Harrington, New Hampshire Technical Institute at Manchester, N. H.; and second vice chairman, Walter Edwards, partner in Hodgon-Edwards Co., South Berwick, Me. John N. MacInnis, chief industrial engineer of Clarostat Mfg. Co., Dover, N. H., was named secretary. James D. Wilson, field engineer of Johnson-deVou Inc., Worcester, Mass., was elected treasurer.

Steel Fabricators Elect Officials

New officers of the American Institute of Steel Construction are: President, R. D. Wood, Mississippi Valley Structural Steel Co., Chicago; first vice president, J. E. Jackson, Pittsburgh-Des Moines Steel Co., Pittsburgh; second vice president, J. Philip Murphy, Judson-Pacific-Murphy Corp., Emeryville, Calif.; executive vice president, L. Abbett Post, New York; treasurer, James M. Straub, Fort Pitt Bridge Works, Pittsburgh; secretary, M. Harvey Smedley, New York.

Four now directors include: R. N. Allen, Star Iron & Steel Co., Tacoma, Wash.; L. J. Knapp, Whitehead & Kales Co., Detroit; Earl A. Jung, August Feine & Sons Co., Buffalo; F. E. Owens, Paxton & Vierling Iron Works, Omaha, Nebr.

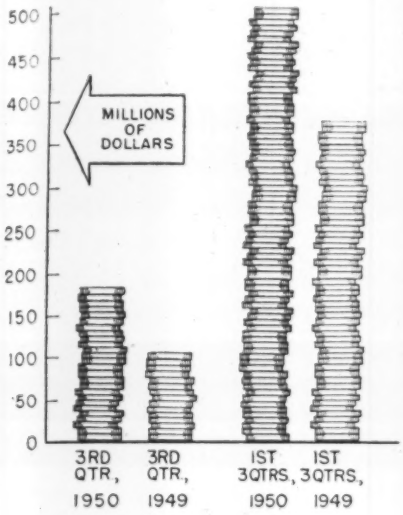
Corrosion Testing Spreads Out

Representatives of over 100 industrial companies and government officials were in attendance at the formal opening of the Harbor Island addition to the Kure Beach corrosion project last month. F. L. LaQue, in charge of the corrosion engineering section of International Nickel Co. Inc., under whose direction the project is operated, made the announcement.

Manufacturers of sometimes competitive projects united against a common enemy, corrosion, to exchange information and data on ways to fight it. The annual toll of corrosion on industry is hundreds of millions of dollars.

Sea water tests were originally located at Kure Beach where they were first established in 1935. They were moved this year to the new station at Harbor Island about 20 miles north. The atmospheric testing lot, covering an acre of ground, is still located at Kure Beach, as is a station about 80 feet from the shoreline for testing the effects of sea water spray. Among the more than 20,000 specimens under test are metals, alloys, nonmetallic materials and protective coatings, including paint, and even rope.

Steel Earnings Better
. . . if compared with last years'



Includes 21 steel producers

Taxes, Inflation Nick Steel Earnings

Steel industry's net profit in third quarter falls 4 per cent under that of the second quarter although there was no drop in ingot output

THE FANGS of the new stiffer tax on corporate incomes gouged a bigger bite out of the steel industry in the third quarter of 1950 as federal taxes wound, serpent-like, more tightly around the nation's economy. At the same time, prices of raw materials ran up on the steelmakers, one large producer finding this additional cost $3.50 per ton of steel.

Result: Twenty-one steel producers representing 84 per cent of the nation's ingot capacity had 4 per cent less profit to show for their labors in the third quarter than in the second quarter, although tonnagewise their production was about the same.

The net profit left to these 21 companies after the 4 per cent drop was $180,861,719, compared with $189,413,319 in the second quarter, as is shown in the accompanying table. In contrast is the sustained rate of ingot output by the industry: 24.9 million net tons in the second quarter and 24.5 million in the third quarter.

Better by Comparison—This reduced rate of earnings was better, the accompanying chart illustrates, than that of the recession-affected third quarter of 1949 when the 21 companies had an aggregate net profit of $102,718,069. This is equivalent to only 56 per cent of the total for the third quarter of 1950.

With 1950 a better business year

Steel Producers' Net Earnings

	3rd Qtr., 1950	2nd Qtr., 1950	3rd Qtr., 1949	1st 3 Qtrs., 1950	1st 3 Qtrs., 1949
United States Steel Corp.	$59,742,302	$69,861,496	$39,171,144	$178,821,540	$133,223,409
Bethlehem Steel Corp.	33,563,841	31,667,643	23,019,799	90,804,414	82,898,402
Republic Steel Corp.	18,682,542	21,080,742	9,870,703	56,384,618	35,347,875
Jones & Laughlin Steel Corp.	11,233,078	11,005,142	4,870,019	26,481,084	20,038,918
Youngstown Sheet & Tube Co.	10,945,138	10,785,832	7,514,626	29,221,911	28,557,991
Inland Steel Co.	12,082,908	11,325,791	7,555,103	32,085,262	23,842,637
Armco Steel Corp.	12,037,343	13,811,641	6,584,411	37,743,114	22,693,044
Wheeling Steel Corp.	5,832,322	4,648,449	2,139,664	13,668,467	8,278,233
Crucible Steel Co. of America	1,991,555	1,304,625		4,055,631	
Colorado Fuel & Iron Corp.	2,545,611	2,201,320	1,414,832	6,360,009	5,901,494
Granite City Steel Co.	1,563,964	1,671,673	528,047	4,437,516	2,223,514
Sharon Steel Corp.	2,706,647	2,959,607	120,520	7,299,884	3,543,312
Alan Wood Steel Co.	628,081	682,448	62,920	1,628,540	1,835,172
Midvale Co.	*47,520	*48,204	*668,149	*274,086	*944,732
Allegheny Ludlum Steel Corp.	2,873,998	2,300,490	*183,341	7,445,169	1,376,660
Continental Steel Corp.	758,722	870,719	205,449	2,469,512	619,254
Keystone Steel & Wire Co.	1,841,719	2,710,017	1,416,197		
Follansbee Steel Corp.	736,977	268,847	*171,254	1,106,706	88,164
Copperweld Steel Co.	284,021	457,746	204,258	927,488	1,425,737
Rotary Electric Steel Co.	558,017	484,552	*115,498	1,353,410	1,206,254
Carpenter Steel Co.	1,083,747	1,452,032	217,783	3,256,732	1,047,610
Detroit Steel Corp.	2,538,205	1,837,354	389,714	5,745,296	2,391,088
Barium Steel Corp.	511,775	†87,999	*12,681	599,774	1,107,927
Totals‡	$180,861,719	$189,413,319	$102,718,069	$507,566,360	$376,701,963
FINISHING CAPACITY ONLY					
Acme Steel Co.	$1,671,350	$1,693,889	$929,221	$4,754,871	$3,327,749
Eastern Stainless Steel Corp.	428,824	236,300	*226,880	845,262	*128,413
Superior Steel Corp.	312,329	258,090	*204,627	704,825	*490,806
Thomas Steel Co.	454,268	452,127	203,370	1,311,930	929,945
Washington Steel Corp.	262,940	190,796		588,856	
PIG IRON CAPACITY ONLY					
Interlake Iron Corp.	$1,138,885	$1,625,338	$1,205,474	$4,058,598	$4,324,623
Sloss-Sheffield Steel & Iron Co.	991,260	1,156,325	403,148	2,726,794	1,790,891
Woodward Iron Co.	1,306,646	1,533,959	1,343,332	3,847,925	4,096,729

* Deficit. † First half. ‡ Excluding Crucible Steel Co. of America and Keystone Steel & Wire Co. because of unavailability of figures for some of the comparative periods.

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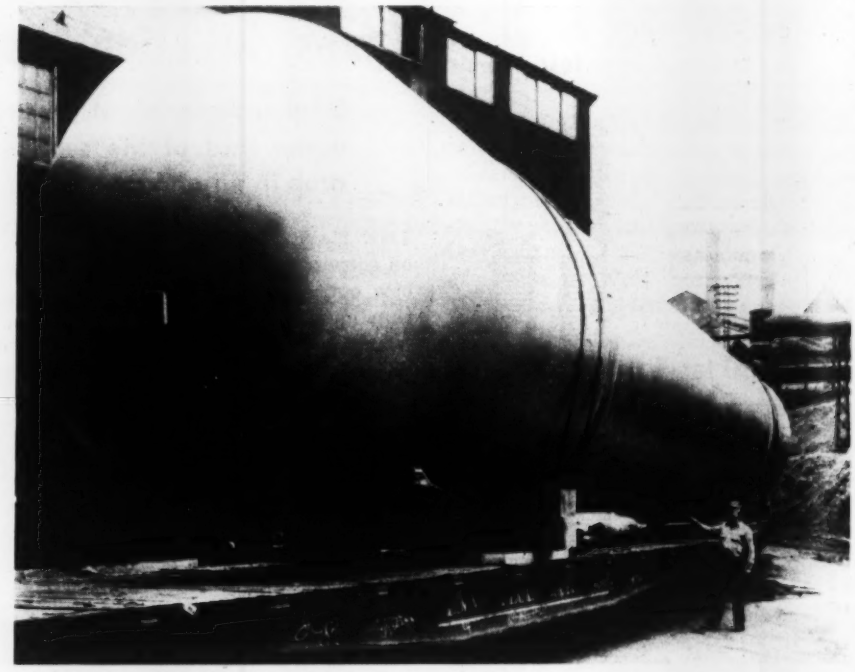
than 1949, the 21 steel producers' aggregate net profit for the first nine months of 1950 is 35 per cent higher than for the corresponding period of last year. Their net profit in the first nine months of 1950 was $507,566,360; in the like period of 1949, $376,701,963.

Less Red Ink—With business being at a higher level this year, only one company reported a net loss for the third quarter and the first nine months. This same company sustained a net loss in the second quarter also. In the third quarter of 1949, five companies had a net loss.

Five companies with finishing capacity only, did better profit-wise in the first nine months of 1950 than in the corresponding period of last year. Except for one of the five companies, they had a third quarter that was better than the second, as the accompanying table shows.

The situation was different for three companies with pig iron capacity only. Each of them, the table shows, had a lower net profit in 1950's third quarter than in the second quarter.



59 TONS OF TANK: This is the largest diameter tank ever made at Bethlehem Steel Co.'s Bethlehem plant. It takes up two railroad cars as it leaves for its destination, Lebanon Valley Gas Co., Lebanon, Pa. The 59-ton tank, constructed by welding 13/16-inch steel plate, is 11 feet, 5½ inches in diameter and is over 81 feet long. It will be used for storage of natural gas

Fansteel Enlarging

New equipment for molybdenum and tungsten will more than double original output

FACILITIES for expanding production of tungsten and molybdenum are being enlarged in Fansteel Metallurgical Corp.'s $390,000 program. The North Chicago, Ill., firm's program involves addition to chemical and ore treating facilities, additional drying and reduction furnaces, adding to hydrogen storage, purification and compressing equipment, more sintering furnaces with transformers and control equipment and new tungsten carbide reaction furnaces.

Much of the equipment will be housed in the present Fansteel-Tantalum Defense plant. A second story is being built on the existing reduction building to provide additional space. A warehouse is also being built so that plant space now used for storing ores and materials may be allocated to production equipment. New construction will total more than 22,000 square feet.

Present Fansteel - Tantalum tungsten and molybdenum facilities were built in 1944 for wartime production. Integration of facilities and more efficient usage have boosted production in recent months to 180 per cent of planned capacity. The new equipment will raise output to 260 per cent of original capacity.

Robert J. Aitchison, Fansteel president, says backlogs for tungsten and molybdenum began to pile up in August and now top $1.5 million for these metals alone. He believes the full impact of military orders will probably not be felt for several months.

Graham-Paige Buys Steel Firm

Graham-Paige Corp. purchased all the capital stock of Whitney Apollo Corp. and the latter's sales subsidiary Whitney Apollo Steel Co. The seller and price were not disclosed.

Whitney Apollo operates rolling mills at Apollo, Pa., and Portsmouth, O. Monthly sheet capacity is 20,000 tons. Present sales volume is running at a $30 million annual rate.

Chairman Joseph W. Frazer says Whitney Apollo will function as a Graham-Paige subsidiary with no change in operating personnel. This purchase represents the second large investment by Graham-Paige in six months. It now operates as a registered investment company and earlier this year it acquired a substantial interest in R. Olsen Oil Co.

Canadian Kellogg Makes Pipe

Operations are started in Canadian Kellogg Ltd.'s new pipe fabricating shop at Edmonton, Alta. M. W. Kellogg Co., engineers and fabricators, is the parent company.

Monthly capacity for the new shop is about 400 tons. It is equipped to fabricate carbon steel and low chrome piping and specialties including stainless steel and high nickel alloys in a full range of pipe sizes.

Cold Heading Plant Added

Beaver Industries, Chicago manufacturer of screw machine products, added a new cold heading department for producing standard and special cold upset screws, studs and rivets. Present equipment, consisting of cold heading machines, automatic screw slotters and automatic thread rollers, has a capacity of more than 5 million screws per month. Plans are already under way for adding more equipment for boosting capacity still higher.

Bethlehem Exploring for Ore

Bethlehem Steel Co. is making preliminary explorations at an iron ore property near Marmora, Ont., approximately 30 miles north of Lake Ontario, 100 miles east of Toronto. On a direct line it is about 130 miles northeast of the company's blast furnaces at Lackawanna, N. Y.

The ore is a magnetite and would be subject to beneficiation should the company decide on commercial operation. Tests have been going on for the last two months and will probably continue for another two or three months before a decision is

reached. A railroad, it is said, runs near the property, thus simplifying the transportation problem.

'Eatdown' Strike

LAST WEEK 2500 UAW-CIO employes of American Metal Products Co., Detroit, cooked up a new one—an "eatdown" strike. Their beef: The management wouldn't let them munch peanuts, popcorn and sandwiches while at their machines. Two weeks earlier, in protest over contract rules, about 70 per cent suddenly produced apples, oranges and cookies at 9 a.m. after starting work. They were sent home for the day. Monday the hungry horde walked out.

Company officers say it is O.K. to crunch candy or chewing gum, according to the union contract which still has 18 months to run. A union official is quoted as saying that a foreman sent an operator home one day for eating salted peanuts, charging this was food, not candy. Chocolate-covered peanuts, on the other hand, mght have gotten by as candy.

Consensus of Industry: Nuts.

Zinc Shortage Hits Granite City

Granite City Steel Co., Granite City, Ill., has cut back its galvanized sheet production one-third because of the zinc scarcity. The company's zinc inventories have been exhausted and the recent galvanized operations have been conducted on a hand-to-mouth basis.

Amortization Forms Available

Application forms and procedures for those who seek federal tax benefits when they expand their facilities for defense production are available at 1725 F St. NW and at the Commerce Department in Washington and at Commerce field offices throughout the country.

Applicatons for authority to amortize emergency facilities over a five-year period, for tax purposes, must be filed originally with the National Security Resources Board. Applications filed with NSRB will be assigned to the appropriate agencies of the government which will examine the applications and make their recommendations. Upon their return to NSRB, the applications and recommendations will be reviewed and the decision made whether the certificates will be issued.

A World Metallurgical Congress

A world metallurgical congress will feature the 33rd National Metal Congress & Exposition scheduled for the state fair grounds in Detroit Oct. 15-19, 1951. Twenty top metallurgists from all free nations will be invited to attend. Dr. Zay Jeffries will serve as chairman.

Engineering Centennial Planned

Plans are being formulated to celebrate 100 years of engineering as an organized profession in the United States. A convocation organized under the title "Centennial of Engineering 1952 Inc." is designed to provide an opportunity for all engineers to gather to exchange ideas and information of value to one another with no group taking a place of special prominence.

Engineering societies in the United States stem from the organization of the American Society of Civil Engineers in 1852. The original society included all phases of engineering and was so called to differentiate its membership from military engineers who prior to 1800 were the only engineers. In the early days of this nation we did not even have military engineers and during the Revolutionary War used Europeans. West Point was founded in 1802 primarily to train military engineers.

Since the founding of the ASCE specialization led to the formation of other engineering groups such as mining, mechanical, electrical and chemical but they all had their inception in the original society.

Preassembled Nut and Lockwasher Cuts Assembly Time

FIRST peek at "Keps," a new preassembled nut and lockwasher developed by Shakeproof Inc., division of Illinois Tool Works, Chicago, was given to Detroit manufacturers last week as the company unveiled its traveling display at the Sheraton Hotel concurrently with the annual technical convention and exhibit of the American Society of Body Engineers.

Raised Collar—The technique of counterboring a nut in such a way that the familiar Shakeproof toothed lockwasher could be snapped in place by means of machines at high speed was not easy to perfect. It took years of study.

Keps, though, are now being produced in volume in a variety of sizes in two basic types to meet standard nut requirements. They conform to American Standard Light Nut Series, as well as to American Standard Machine Screw and American Standard Regular Nut Series. The latter type is slightly different in design, having a groove machined in the lower face into which the washer with raised collar is fitted and the inner edge swaged over to hold the washer loosely in place. The standard light nut type has the washer with slightly flared collar snapped into a specially shaped counterbore where it is held firmly but still will spin.

Production is centered in a new plant at Elgin, Ill. It is equipped with advanced types of materials handling, plating and other machine equipment: Four full automatic Stevens barrel plating machines, with Syntron loaders, are said to be handled by a single operator. Movement of loaded tote pans is almost entirely by roller and belt conveyors.

Time Saving Offsets Cost—Advantages claimed for Keps which cost roughly twice as much as conventional nuts and split-ring lockwashers, include: Reduced time and effort in applying nuts and lockwashers since one preassembled unit is handled in place of two separate parts; simplified ordering, stocking and material handling; greater actual contact between the bottom surface of the nut and the locking teeth of the washer; easier starting on bolts because of the "funnel" action of the washer which pilots the nut into proper thread engagement position; assurance of a properly matched washer under every nut and no waste in the form of lost lockwashers; simplified quality control procedures because lockwashers cannot be omitted at assembly; a design which permits use of external toothed washers under nuts conforming to American Standard Light Nut Specifications—a particularly important feature in the automotive industry where nuts of this type are used extensively.

Whence the Name—Keps, a name derived from ShaKEProof, is a companion product to the familiar Sems, preassembled screws (or bolts) and lockwashers introduced to the trade some 15 years ago. Lockwashers are held on the screws by automatic assembly before thread rolling, the latter process extruding the shank metal so that the thread diameter exceeds the shank diameter. These are now produced by the billions annually, both at Shakeproof and at plants of its 28 licensees. It is the intention to license other manufacturers to supply Keps similarly. Shakeproof will furnish the necessary machine equipment.

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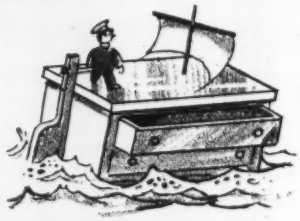
Windows of Washington

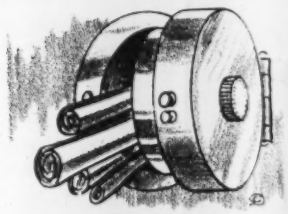
By E. C. KREUTZBERG *Washington Editor, STEEL*

Heat on Lobbyists

Contract Backfire



New Ship Bureau



Atomic Patents

Republicans label majority lobbying report a smear on American system . . . Industry wants assurances it won't be holding bag if it helps Europeans in North Atlantic Pact

"AN ATTEMPT to smear American enterprise and to discredit our American system." That is the way the three Republican members of the House Committee on Lobbying — Reps. Charles A. Halleck (Ind.), Clarence J. Brown (O.), and Joseph P. O'Hara (Minn.)—characterize the report of the Democratic majority—Reps. Frank Buchanan (Pa.), Henderson Lanham (Ga.), Carl Albert (Okla.), and Clyde Doyle (Calif.).

Clusters of Power—After months of study and open hearings, the majority asked "whether our kind of popular government can indefinitely absorb the impact of an inherently expansive system of organized pressure; whether we can continue to afford the social cleavages, the clusters of private power of which this mounting pressure is both cause and symptom."

The majority reports says lobbying is easily a billion-dollar business, and the public pays the bill. Organized business, it says, lobbies the most, putting the expense on the prices it charges. There is one adverse reference to labor union lobbying.

"A Higher Level" — The report questioned statements by U. S. Steel and others that they had spent nothing on seeking to influence legislation and had made no contributions to organizations that distribute material about public issues. The 152 corporations that replied to the committee questionnaire (STEEL, June 12, p. 71, June 19, p. 57, June 26, p. 53) reported that they had spent $32,124,800 in the period from Jan. 1, 1947, to June 1, 1950, on activities "relating to attempts to influence legislation." That covered trips to Washington, cost of printed matter and advertising, contributions to associations, etc. The same 152 corporations, states the majority report, indicated lobbying spending of only $750,000 in registering under the Lobby Act. The Majority thinks the Regulation of Lobbying Act needs some amendments to eliminate present misconstructions and to bring regulation of lobbies to a "higher level of efficiency."

Not So Fast . . .

Companies giving technological assistance to European industries that are to produce military materiel under the North Atlantic Pact want to be sure they get paid for their services and equipment. They're still smarting over the failure of the Russians to live up to their agreements to pay for American assistance that enabled them to expand their petroleum refining, steel and other industries in World War II.

European Jeep Wheels—The subject was a hot one at a meeting called by the State Department on the eve of negotiating an agreement covering the exchange of technical knowledge that will be necessary to re-arm Western Europe. This is the way the job will be done: Materiel and supplies to be made by Europeans will be duplicates of similar products made in the U. S. European ammunition must be usable in American guns, Jeep wheels made in Europe must fit Jeeps made in the U. S., and so on. Because of various tactical factors, the range of military goods to be made in Europe will be comprehensive. Hence, many American firms will be called on to place their patents, processes and other know-how at the disposal of the Europeans.

Three Assurances—American manufacturers were told by Michael Cardozo, assistant legal adviser for economic affairs, that their full co-operation would be necessary to make the program effective. He wanted to know what sort of an agreement would be necessary with Europeans in on the program to win American co-operation. Some 100 industrialists—representatives of the electronics, chemical, industrial equipment, petroleum and other key industries—thought these three assurances were necessary: As far as possible normal contractual procedure between individual American and European countries should be the rule. If American firms suffer loss from non-payment by Europeans, the U. S. government should indemnify them. American companies should not be harassed by the Justice Department years from now with the claim that European-American contracts were cartel arrangements or otherwise illegal.

Shop-by-Shop Inspection . . .

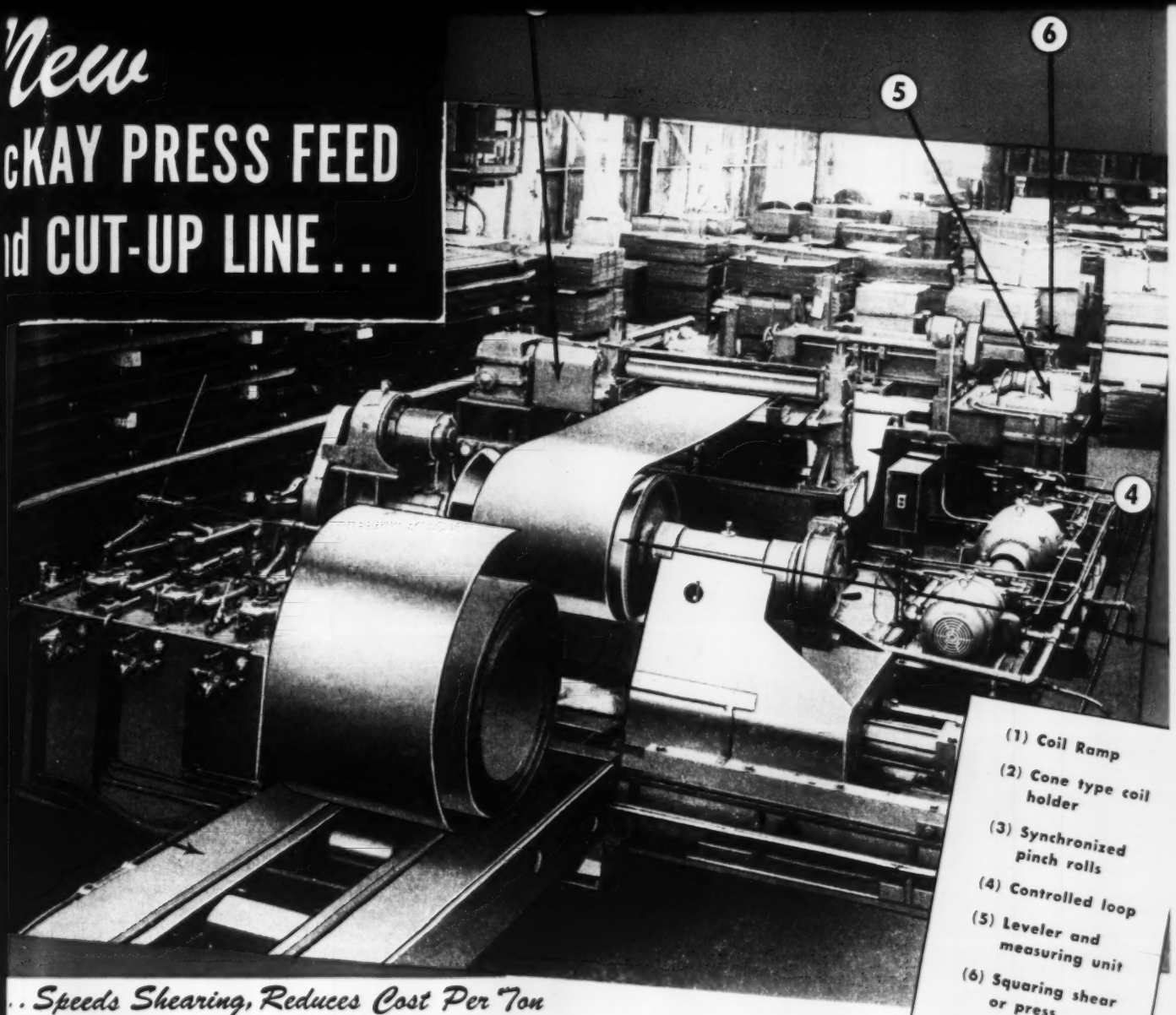
R. E. W. Harrison, known to the machine tool industry, has a new job. He's head of the new Industrial Engineering Division in the Bureau of Ships. As a recommissioned Navy commander, he will inspect shipyards on a shop-by-shop basis to find out where efficient production techniques used in private industry can be used advantageously in the yards. When he finds them, he'll recommend improved methods and the replacement of existing machine tools and other equipment. The idea is to turn out better work in less time and with the expenditure of fewer man-hours.

He'll be assisted by a staff of civilian specialists being recruited from private industry. The staff men must have comprehensive knowledge of thoroughly modern practices about shipyard work and they must have had at least ten years' experience as supervisors in private industry.

AEC Declassifies Two Patents . . .

You may be interested in either or both of two patents that the Atomic Energy Commission has declassified. They may be purchased from the U. S. Patent Office. One is Patent No. 2,519,792, on a process for electrolytic production of metallic uranium. The other is No. 2,514,116, covering an induction reamer for use on the interior of a cylindrical tube; an unattached circular tool carrying a squirrel-cage winding is rotated inside the tube by means of a rotating magnetic field generated through the squirrel-cage winding.

New
cKAY PRESS FEED
ıd CUT-UP LINE...



...Speeds Shearing, Reduces Cost Per Ton
for BRIGGS MANUFACTURING COMPANY

THE Briggs Manufacturing Company, one of the leading producers of automobile bodies and plumbing fixtures, has recently installed a 48" wide McKay press feed line to speed coil shearing at its new Youngstown, Ohio, plant.

On one production run, Briggs sheared 215 tons of 36" wide, 48" long, 14 gage sheets from coil, in 16 hours operation. On another occasion 17,000 cuts were made on a two shift basis. Although these production figures do not represent the absolute capacity of this line, they do indicate the dependability and ruggedness of McKay equipment.

The installation illustrated above utilizes hydraulic drives and hydraulic control equipment. Similar lines using electrical drives and electrical control are available.

All equipment illustrated above is applicable to a press feed line merely by substituting a press in place of a shear.

Consult McKay engineers if you have a press or shear feeding problem.

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Acetic Acid
Ammonia Alum
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Aqua Ammonia
Chromium Fluoride
Fluoboric Acid
Hydrofluoric Acid
Hydrogen Peroxide
Metal Fluoborate Solutions
(Lead, Tin, Zinc, Copper, Nickel)
Muriatic Acid (Hydrochloric)
Nitric Acid
Potash Alum
Sodium Bifluoride
Sodium Fluoride
Sodium Metasilicate
Stannous Chloride
Sulfuric Acid
Tetrasodium Pyrophosphate
Trisodium Phosphate

STEEL
Iron & Steel Manufacture
Copper Fluoride
Iron Sulfide
Sodium Bisulfite, Anhydrous
Sodium Sulfite, Anhydrous
Sulfur
Rimming Steel Manufacture
Sodium Fluoride

PICKLING & DESCALING
Acetic Acid
Fluoboric Acid
Hydrofluoric Acid
Muriatic Acid
(Hydrochloric)
Nitre Cake
Nitric Acid
Phosphoric Acid
Sodium Bifluoride
Sodium Fluoride
Sulfuric Acid

LIGHT METALS—*Casting*
Ammonium Fluoborate
Potassium Fluoborate
Sodium Fluoborate

HEAT TREATING
Barium Fluoride
Potassium Fluoride
Sodium Fluoride

FINISHING
Electrolytic Polishing
Acetic Acid
Hydrofluoric Acid
Perchloric Acid
Sulfuric Acid
Bright Dipping
Acetic Acid
Hydrofluoric Acid
Muriatic Acid
(Hydrochloric)
Nitric Acid
Phosphoric Acid
Sulfuric Acid
Oxide Finishing—Anodizing
Hydrofluoric Acid
Nitric Acid
Oxalic Acid
Sodium Silicate
Sulfuric Acid
Galvanizing and Tinning
Hydrochloric Acid (Muriatic)
Sodium Fluoride
Sulfuric Acid
Nitric Acid

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Progress Slow on the Schuman Plan

The problem of price equalization is the main stumbling block in implementing the scheme to pool operations of European steel and coal producers

DELEGATES to the Paris conference on the Schuman plan for a European coal-steel pool are still wrestling with the problem of price differentials from country to country.

But the conferees have made progress. The pool will probably be managed by a High Authority comprising six to nine members appointed by the governments of participating countries. That body would be supervised by a Common Assembly, consisting of delegates of national parliaments. There would also be a Special Council of Ministers, whose duties are not yet clear, but whose intervention would be required in certain cases. A Court of Appeal would be created to which governments, perhaps even companies, could resort.

Big Job—The most important function of the High Authority would be the gradual establishment of a single market for coal and steel through gradual price and wage equalization, unification of transportation tariffs, removal of customs duties inside the pool and prohibition of double-pricing.

What the equal price levels should be is the big headache now. The French, whose industrial prices are generally as high or higher than elsewhere in Europe, are insisting that most prices be brought to their level. The Germans, particularly, want lower levels.

Big Powers—The High Authority would also have powers to influence governments to co-ordinate their output and investment programs to avoid wide fluctuations in employment. While the group would generally proceed through recommendations, in certain cases it would also have the power to enforce decisions. It would be authorized to represent the participating governments in trade negotiations.

The problems still to be solved are knotty, but few Western Europeans seriously doubt that the Schuman Plan will eventually come through.

Coal Is the Difficulty in Germany

The French want the Germans to increase their domestic coal prices by 9 marks or $2.17 per ton under the Schuman plan. The West Germans don't want to go up that much, for fear that their profitable coal markets will disappear.

The new republic needs every export market it can get because its government has just had to suspend foreign exchange payment and consumer imports to halt the drain on the country's financial reserves. The Bonn government's limited reserves of foreign exchange and credits from the European Payments Union, which were supposed to have lasted 12 months, have been going down steadily for three months. Before restrictions went into effect, the drain had shot to $8 million a day.

West Germany's financial problems may have influenced Sweden in refusing to hike iron ore shipments to the Ruhr. The Germans hoped to contract for 6.6 million tons of Swedish ore in 1951, but Sweden has offered only 4,950,000 tons. Sweden has also asked higher prices for the raw material which would cost Ruhr steelmen an additional $10 to $11 million yearly. Before the war, Germany imported 75 to 80 per cent of Sweden's total ore production. Britain and Poland have booked large orders for the Scandinavian ore.

Foreign inquiries for German rolling mill products still are heavy, but the demand has now shifted from North American to Latin American buyers. An Argentine importer is trying to get $100 million worth of rolled steels. Total order backlogs of steel and rolling mill plants have reached 6.6 million tons, of which 1,650,000 tons are foreign orders.

And in Belgium, Too

A stumbling block for Schuman planners has also been Belgian coal. The Belgian operators would need subsidies to make their mines competitive with those of the Germans. No solution is yet in sight.

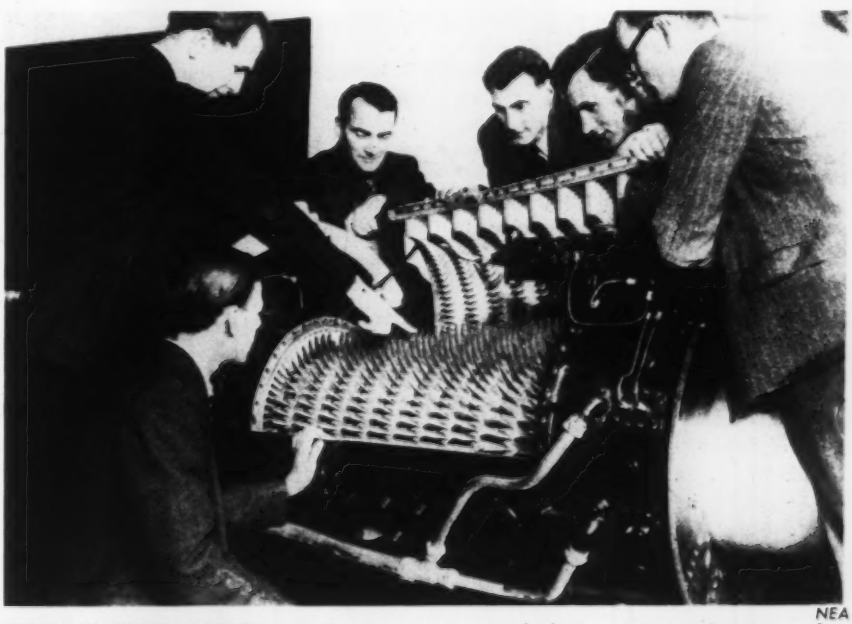
The Korean-engendered business boom was the agent resolving the nation's economic puzzle last summer. During the first six months of 1950 the nation shipped only 1,876,000 tons of steel from its major port, Antwerp, compared with 2,220,000 tons in the same 1949 period. Second-half exports are skyrocketing and the 1950 total may exceed the 1949 level. Major consumers of Belgian steel, which is the country's key export, are Holland, the U. S., Sweden, Britain, Pakistan and Switzerland.

Belgian price levels are rising, and the situation may force government action. Scrap quotations currently are firm. In the steel consuming industries, the demand for capital goods is increasing. Defense orders from the government are expected.

Britain Stays Aloof

The British continue to have observers at the Schuman conferences, but they are as far from actual participation in the pool as ever.

Aside from political considerations, a major reason why the British won't participate is that they're in the best



NEA

TURBINE TECHNOLOGY: Pointing out some of the prominent features of a jet engine to a group of students at the School of Gas Turbine Technology in Farnborough, England, is an instructor of the school. Object of the school is to adequately staff the gas turbine industry

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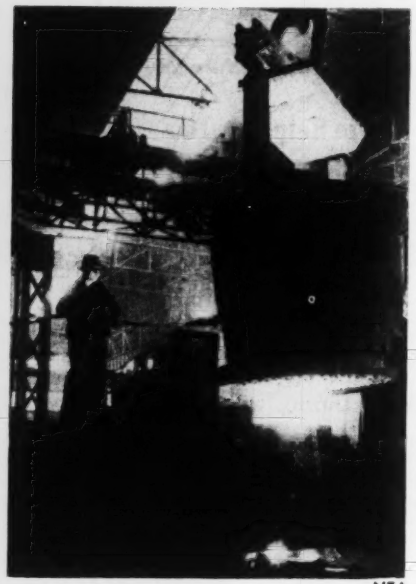
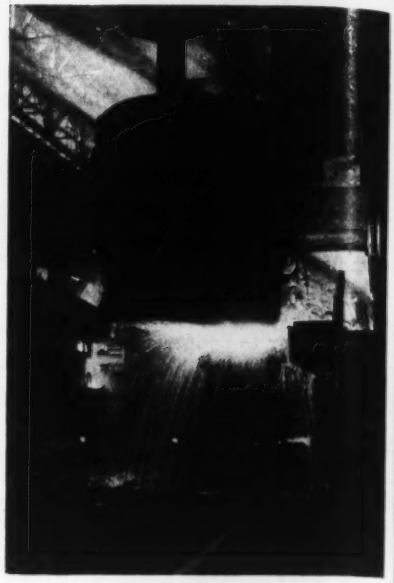


NEA

CZECH STEEL: Says an official Soviet source, workers of the Marshal Konev steel mill in Kladno, Czechoslovakia are producing steel over and above their quotas. The scene is in the Konev-Kladno open-hearth shop



FORD STEEL: Ford's Rouge steel mill pours the millionth ton of ingot steel to be produced there this year. Currently it is producing at the rate of 100,000 tons monthly, hopes to produce 1,250,000 tons by yearend

competitive position in Europe on steel exports. They have price, capacity to produce and even fair delivery dates in bidding for export business. They figure they have little to gain, much to lose in any European pool.

In a Bank of England study of the changes in U. K. overseas investment for each year between 1938 and 1948, the nominal value of U. K. investments abroad is estimated to have fallen from £3545 million in 1938 to £1960 million in 1948. While the remaining overseas assets are still substantial, they are more than outweighed by overseas indebtedness incurred during and after the war. Remaining assets in Commonwealth countries total £866 million, 43 per cent of the 1938 sum. Assets in foreign countries total £725 million, 50 per cent of the 1938 sum. Largest foreign investments are in Argentina—£317 million worth or 86 per cent of the 1938 total. British assets in the U. S. are worth £193 million, 72 per cent of the 1938 total.

FEI Gets Japanese Contract

Furnace Engineers Inc., Pittsburgh, will rebuild four batteries of soaking pits in Japan. The contract calls for rebuilding 60 pits, says Harry Dobrin, president of Furnace Engineers. Orders from American steel companies are giving it the heaviest business in its history.

Where Is All the Steel Going? Here's the Answer

BACK in 1943 during World War II, the nation's furnaces turned out 88.8 million ingot tons of steel. With that steel we fought a war, supplied Europe, including Russia, with steel and military materiel and had an unprecedentedly large shipbuilding program. This year, we'll turn out 95 million ingot tons of steel. We are not yet in World War III. Europe is supplying us with steel. No American steel is going to Russia. We have a tiny shipbuilding program. Where's all the steel going?

Then and Now—In 1943, 965,000 cars and trucks were assembled in the U. S. and Canada. The industry consumed less than 750,000 tons of sheet and strip in the entire year. This year the industry will build more than 8 million cars and trucks. In the first six months of 1950 it consumed nearly 4.8 million tons of sheet and strip, more than 7.1 million tons of all steel products.

In 1943, only about 140,000 new nonfarm dwellings were started in the U. S. This year an estimated 1.2 million will be started. More than 4.5 tons of steel go into the average house. More than 1 million tons of steel, including 908,000 tons of sheet and strip went into home appliances in the first half of this year; little of the metal was used for that purpose in 1943. An estimated 6.3 million refrigerators will be built this year, compared with 156,697 in 1943. An estimated 8.2 million electric flat irons will be made in 1950; none were built in 1943. An estimated 6.7 million television sets will be made this year; none were built in 1943.

Take a look at the accompanying table which shows shipments for the first eight months of 1950. That's where the steel is going.

Market Classification	Net Tons Jan.-Aug., 1950	Per Cent of Total
Steel for converting and processing	2,329,254	5.1
Forgings (other than automotive)	676,858	1.5
Bolts, nuts, rivets and screws	929,629	2.0
Jobbers	8,692,882	19.0
Construction, including maintenance	5,490,675	12.0
Automotive	9,547,689	20.9
Contractors' products	2,009,723	4.4
Rail transportation	2,725,306	6.0
Shipbuilding and marine equipment	199,243	0.4
Aircraft	24,460	—
Total	45,692,913	100.0

Market Classification	Net Tons Jan.-Aug., 1950	Per Cent of Total
Oil and gas drilling	393,580	0.9
Mining, quarrying and lumbering	167,920	0.4
Agriculture	1,035,430	2.3
Machinery, indus. equipment, tools	2,239,071	4.9
Electrical Machinery, equipment	1,129,311	2.5
Appliances, utensils and cutlery	1,376,121	3.0
Other Domestic, comm. equipment	1,156,536	2.5
Containers	3,866,103	8.5
Ordnance and other military	58,057	0.1
Export	1,645,065	3.6

More Air Research

New command will emphasize long-range and developmental activities of the Air Force

AIR FORCE'S Air Research & Development Command (ARDC), established as a planning unit last January, is scheduled to begin operating as an independent major USAF command by May 15, 1951. Interim headquarters will be at Wright-Patterson Air Force Base, Dayton, O.

Gen. Hoyt S. Vandenberg, Air Force chief of staff, has signed the directives covering the transfer of Air Force research and development activities to the new command which was organized to further emphasize long-range and developmental activities.

Lt. Gen. B. W. Chidlaw, commanding general of the Air Materiel Command (AMC) at Wright-Patterson, will supervise organization and manning of the new command.

Move Men, More Money — Representatives of ARDC will remain in the Washington area for liaison purposes until permanent headquarters are set up. Under present plans the Arnold Engineering Development Center at Tullahoma, Tenn., now operating directly under the chief of staff, and the Electronics Development Center at Griffiss Air Force Base, Rome, N. Y., will be assigned as major divisions of ARDC.

Although the move will require the gradual transfer of research and development activities from AMC to the new command, General Vandenberg says that it would mean little decrease in the level of activity at Wright-Patterson. But a substantial increase in personnel is anticipated for the new command.

The general points out that it was a broadening of functions to further emphasize research and development in the Air Force.

AMC will remain responsible for procurement, maintenance, supply and support engineering for the Air Force and will carry out the program of buying of many millions of dollars worth of materiel annually.

Jet Engine Life Increased

American jet planes are flying higher and farther because of the unique chemical development of a Pittsburgh scientist, Dr. Howard M. Elsey, consulting chemist at Westinghouse Research Laboratories. He reveals that specially treated carbon brushes increase the high-altitude life of jet engines many times.

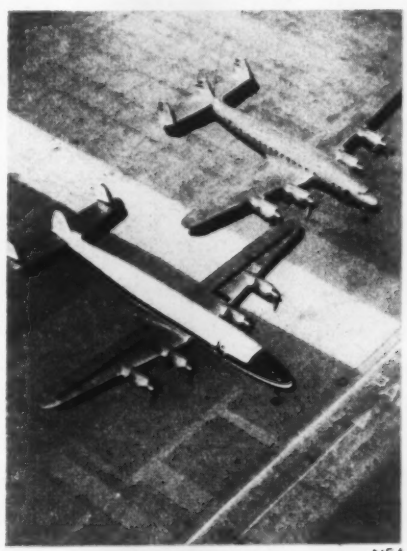
Carbon brushes are small, porous blocks of carbon that convey electricity from the rotating commutator of the generator to the plane's radio, gun turrets and other vital auxiliaries. In the extremely dry air at 40,000 or 50,000 feet the brushes must create their own lubrication or they grind themselves to powder against the copper commutator and the flow of electricity will stop.

Dr. Elsey solved the problem by impregnating the brushes with a special compound in the same family as table salt. Now, as brushes are pressed against the revolving commutator, the new ingredient promotes the formation of a lubricating film that prevents harmful friction at the highest altitudes attainable. The lubricating film is so thin that 2000 layers would barely equal the thickness of a sheet of paper.

Life in Propellers Yet

New engines that Roy T. Hurley, president of Wright Aeronautical Corp., believes will increase the usefulness of propellers for many years to come were unveiled at the Waldorf-Astoria in New York for a group of editors and publishers.

Four of the new power plants are gas turbines that will be built in the U. S. under terms of an agreement reached between Wright and Armstrong-Siddely Ltd., London. A fifth, the new Wright "Compound" engine was announced as the engine for the new Lockheed Constellation transport. The combination of the companies' know-how and the merits of the turbo-prop engines will give a wide range of versatile powerplant-propeller combinations for military and commercial use, Wright officials believe.



NEA

TRANSITIONAL CRAFT: The new giant Lockheed Super Constellation, making the older model Constellation look like a smaller brother, is the latest addition to America's commercial and military sky fleets. It uses the new Wright "Compound" engine (see story), designed to bridge the gap between modern planes and the first American jet transport. The Super Constellation has longer range, greater carrying capacity, new fuel economies. Lockheed says the new engines give less vibration and less noise on the new plane

Douglas Flying High

Stemming mainly from military orders under 1951 procurement and supplemental appropriations since Korea, backlog of Douglas Aircraft Co. Inc., Santa Monica, Calif., increased 131 per cent since June 30.

In a nine-month report issued last week, the West Coast planemaker declared it had $625,498,849 of orders on its books, an increase of more than $354 million since June 30. Not all of the orders are from the military. $100 million are for 91 DC-6 transports.

Sales for the period covered in the report were $95,276,036. The company stated that impetus of the rearmament program will not materially affect sales and employment figures before the spring and summer of next year.

Present employment at the firm's plants at Santa Monica, Long Beach, and El Segundo is 22,716.

United To Get 14 More DC-6Bs

United Air Lines ordered 14 new Douglas DC-6B transport planes. They'll cost about $14 million. The order is in addition to six DC-6Bs for delivery beginning the first of the year. The entire complement of 20 planes will be delivered by August, 1952. United has 44 of the original DC-6 type in service. The DC-6B is a larger version carrying 58 instead of 50 passengers.

Ferro Enamel Holds Contest

Ferro Enamel Corp., Cleveland, is again holding a student competition in porcelain enameling. Purpose of the competition is to contribute greater consiousness in ceramic education. The competition is open to undergraduate and graduate students in ceramic schools in the United States and Canada and will offer cash prizes totaling $1000. The contest closes next Mar. 16, but entry blanks must be submitted by Jan. 15. Prizes will be awarded at the 53rd annual meeting of the American Ceramic Society to be held in Chicago, Apr. 22-26, 1951.

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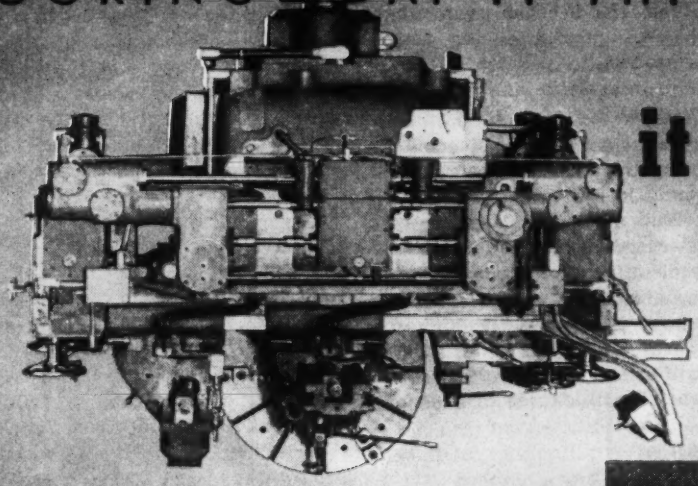
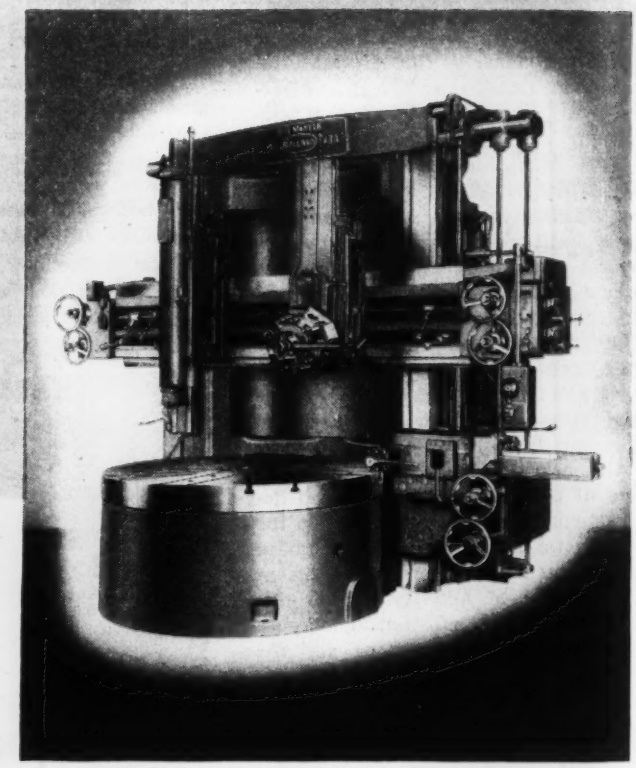
LOOKING AT IT THIS WAY . . . .



it has Massive Depth and Width . . .



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By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

GM's Wilson thinks steel men underestimated postwar demand. Inland's Ryerson retorts the steel expansion was what made the auto industry's growth possible

DETROIT

WORK harder and longer—say 45 hours a week instead of 40. That's one antidote for the creeping inflation that has infiltered the national economy in the past ten years, proposed by General Motors president C. E. Wilson. The GM prexy has been rattling off speeches by the dozen in recent weeks, the most recent being at the business forum of the American Society for Metals in Chicago Oct. 26 (STEEL, Oct. 30, p. 29). And his talks are not all patterned on the same frame either, suggesting that either C. E. is spending most of his time writing, or has assembled an able crew of idea men for the job.

Hoots of Derision — The 45-hour work week is not a new device for Mr. Wilson. He proposed it several years ago and was hooted down in derision by the UAW-CIO. As before, the UAW boys lost no time in shooting the needle to the suggestion, saying they would be glad to work 45 hours a week, with five hours at time-and-a-half pay. But they also think there is not going to be any manpower shortage which would demand overtime schedules—at least for a considerable time—because new credit restrictions, materials shortages and lack of defense orders to take up the slack of declining consumer goods sales point to "layoffs and unemployment."

A Pleasant Voice—The trouble is that nobody knows for sure what's going to happen. Predictions are a nickel a dozen so the smart thing to do may be to forget them all and just watch and wait. Auto dealers continue to moan about 50 per cent sales declines in new cars, 70 per cent in used. Ads are beginning to appear in newspapers . . . "Wanna buy a new ———. Right now and at a couple hundred off list."

Phones are jingling and pleasant voices inquire . . . "Could we interest you in a new ——— to replace the ——— you bought a year ago. Immediate delivery. Good deal on your old car."

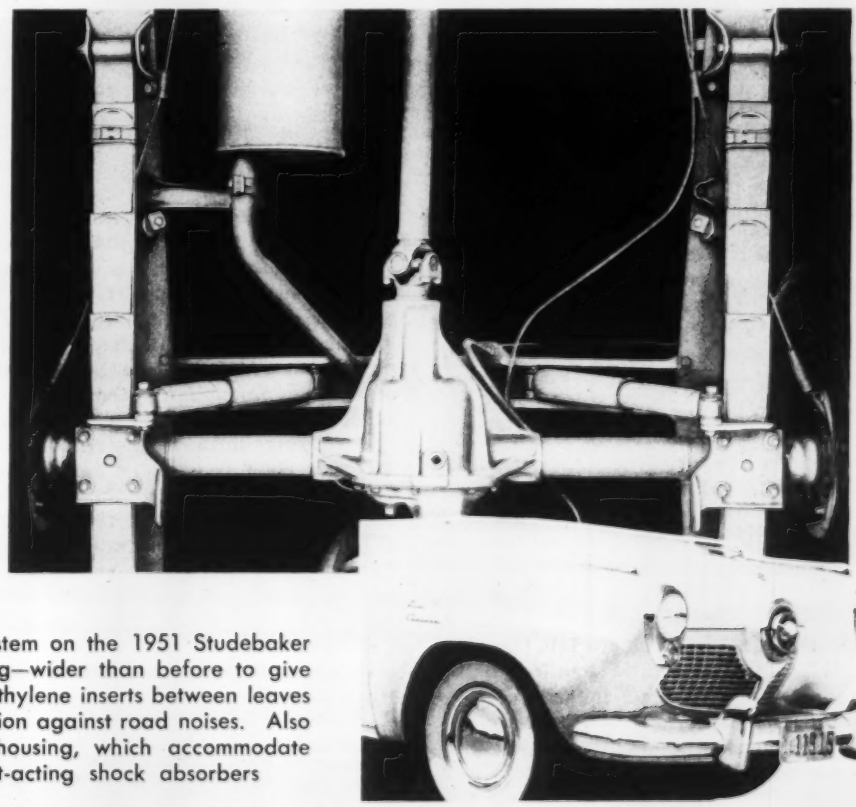
It could well be that the bloom is definitely off the surging automobile market. Maybe it's a good thing. No one in his right mind believed the industry could long keep on batting out the cars and trucks at a rate of 8 million a year or better. A pace of 5.5 million would be more like it and that would probably not mean any broad-scale layoffs in the auto plants.

After Formal Comment — To get back to Mr. Wilson's remarks in Chicago—the juiciest part came after his formal comment on "the automobile industry in peace and war." Another speaker at the forum, Edward L. Ryerson, chairman of Inland Steel, in urging patience with and confidence in the steel industry's expansion program, said that under existing conditions there are bound to be "some" who are impatient because they cannot expand their manufacturing operations sufficiently to meet the demand for consumer goods because of too little steel. There was not much doubt he had the automobile and parts industries primarily in mind as he went on to deprecate those "who may have met this condition by obtaining steel through what are known as gray, black or red markets."

Free-Hand Comments—That was a challenge Mr. Wilson could not ignore, so he took the floor for a few free-hand comments on the steel industry. To start with, he told the story of the late Bill Knudsen's early experience in Washington in the fall of 1941 when he was sprayed by politicians alternately with perfume and something quite the reverse, to the point where both treatments began to smell and taste about the same.

That is the double treatment the steel industry has been getting from the politicos—and possibly from the customers and the public, too, and Mr. Wilson guessed maybe it had blurred the industry's vision a bit.

They Were Not Alone—Continuing he threw the following . . . "Now, if my good friend, Mr. Ryerson, will pardon me, I think the men in the steel industry made two basic mis-



CLOSE UP: The new rear suspension system on the 1951 Studebaker has a four-leaf, two-and-a-half-inch spring—wider than before to give greater lateral stability. Full-length polyethylene inserts between leaves keep out dirt and moisture, provide insulation against road noises. Also shown are the new differential carrier housing, which accommodate a wider range of gears, and direct-acting shock absorbers

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takes in underestimating the demand. They were not alone in it. Other people underestimated demands in their lines (notably automotive) but when they did they could put on two shifts or three shifts or work some Saturdays and increase output. The steel industry does not have the flexibility most of its customers have in consuming steel.

Bigger Believer — "One (of the basic mistakes in forecasting requirements) was the number of people gainfully employed in this country. Before the war there were never over about 45 million and now it is 60 million. Steel is so vital to our modern life. I think I am a bigger believer in the steel industry than maybe some of the people that are in it. We cannot get along without steel and we cannot keep people employed without steel.

"The second was the fact that, with our improving technology, it would take more and more steel to keep a man working. If you think about it and go back into the business a little way, you will realize that is so.

"In the steel industry, in most cases, the same men are responsible now that had the tough going in the 1930s, when a lot of blast furnaces were shut down and cold. If you ever want to have a discouraging experience, go through a steel mill when it is shut down. So these men were all worrying about when they were going to shut down again, and they didn't have enough confidence, from my point of view, in our country and its growth."

Perfume—Pshaw — Finally, Wilson cited figures of 50 years' progress in the U. S., indicating the steel industry had multiplied production to eight times the 1900 total, while the oil industry had pushed to 30 times its 1900 output, and the automobile industry 2000 times. He pleasantly urged "Mr. Ryerson and his friends in the steel business to get that perfume and so forth out of their eyes and go ahead with the country."

But it was no joke to Mr. Ryerson who in the few remaining minutes said his industry had "never been treated with that kind of perfume anyway" and that "the automotive industry would not have grown without the steel industry having grown to make that possible."

Some in the audience felt that Mr. Wilson went a little too far in his chiding of the steel industry. They thought he was even taking the Washington and Walter Reuther line, which is about as far from the actual fact as it is possible to be. At any rate it was all good clean fun, despite the bad but limited press the GM president received.

Auto, Truck Output

U. S. and Canada

	1950	1949
January	609,882	445,092
February	505,593	443,734
March	610,678	543,711
April	585,705	569,728
May	721,161	508,101
June	897,864	523,689
Six Months	3,941,883	3,034,055
July	746,771	604,351
August	842,304	678,092
September	760,808	657,073
October	805,000*	601,021
November		474,731
December		384,318
Total		6,533,641

Weekly Estimates

Week Ended	1950	1949
Oct. 14	174,234	146,566
Oct. 21	188,323	143,049
Oct. 28	187,525	137,651
Nov. 4	185,000	116,699

Estimates by Ward's Automotive Reports

* Preliminary.

Like Sears Without Roebuck . . .

Chrysler boss K. T. Keller takes over the post of chairman of the Office of Guided Missiles for the armed services and will be spending considerable time in Washington organizing the group. He has been doing about a three-day stint each week on the job since Sept. 1 and is donating his services as well as paying his own expenses.

The inference is that the various guided missiles projects, of which there are many in both unrestricted and secret categories, are coming closer to the production stage, since Mr. Keller is primarily a manufacturing and tooling expert. In the last war, for example, he played a leading role in bringing Chrysler into production of medium tanks and in developing production techniques for separation of fissionable uranium by the gaseous diffusion method. The Chrysler chief is a realist as far as armament is concerned, he has no truck with such stuff as the dreamers of "pushbutton" warfare conduct. He will be 65 this month and eligible for retirement, but the betting is that he will keep a firm hold of corporation reins since Chrysler without Mr. Keller would be like Sears without Roebuck.

Office of Defense Products . . .

Ford reorganized its defense production division into an office of defense products (a staff activity with R. E. Krafve as director) because of expansion of the company's participation in the defense program. Operating responsibilities for defense products will be assigned to existing divisions or by establishment of new divisions such as the aircraft engine unit at Chicago. The staff office will be responsible for planning and coordinating the company's defense production program and will conduct contract negotiations.

Other personnel include Gerald J. Lynch, assistant director — finance and contract administration, Harold R. Foss, assistant director—production and facilities, John F. Cooney, Washington representative, W. A. Moriarty, Dayton, O., representative and James L. Cameron Jr., legal adviser.

Black Now, But It Was Red . . .

Although operations now are reported in the black, the first nine months of the year were rough financially for Packard, showing a loss of $1,499,799 after income tax carryback refund of $885,000. In the like period a year ago, income exceeded $9 million. In the third quarter losses encountered in July and August because of new model expense and a two-week strike were largely offset by a favorable September.

Over 21,000 cars of the 1951 series have now been built and it is anticipated by the end of the year the earlier deficit will have been erased. Navy contracts for $5 million, covering diesel engine developmental work, are on the books, but are only a drop in the bucket stacked up against the company's potential capacity for defense materiel output, even without impairing automotive assemblies.

Another Rousing GM Quarter . . .

Contrasting with the Packard showing was another rousing quarter piled up by the General Motors divisions. Sales just short of a million cars and trucks brought net income of $217,377,767, equivalent to $2.44 per share of the new common stock, split two for one Oct. 2. For nine months, GM output added up to 2,877,089, or 113,000 more than the total for all of last year.

Ford Works on New V-8 . . .

Ford Motor Co. of Canada is working on the development of a new overhead valve V-8 engine, presumably of the high-compression type now being built by Olds, Cadillac and Studebaker.

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Cleveland, Ohio

7251 General Motors Building
Detroit, Michigan

403 W. Eighth Street
Los Angeles 14, California

528 Fisher Building
Detroit, Michigan

3104 Smith Tower
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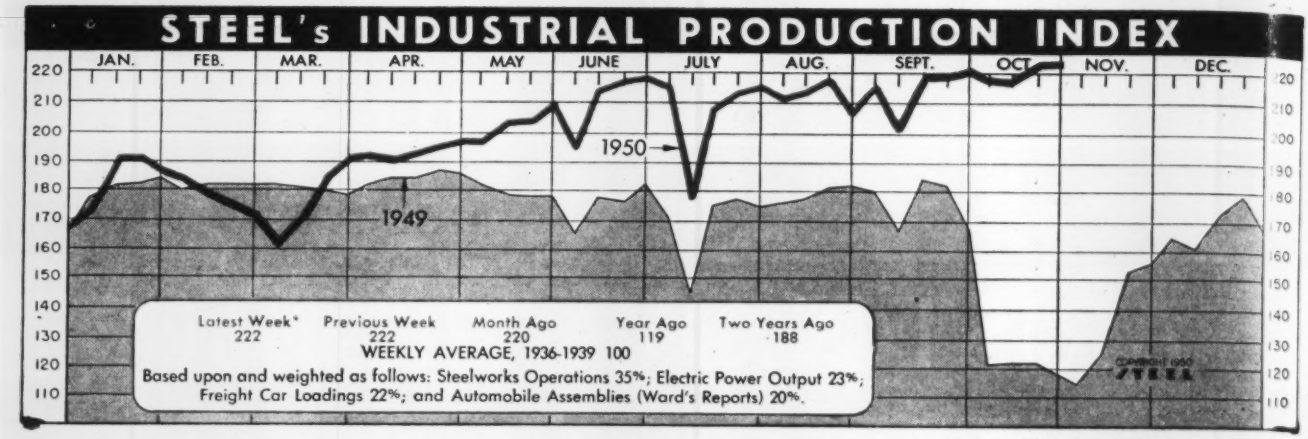
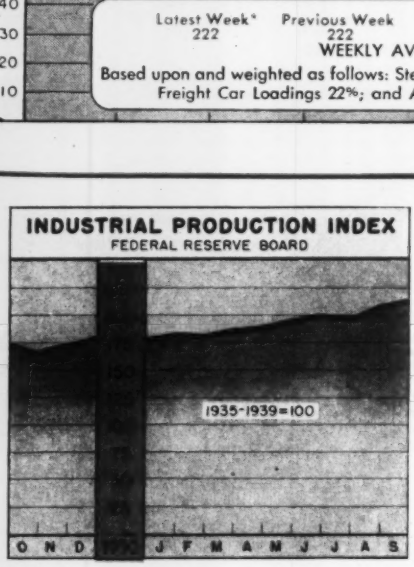
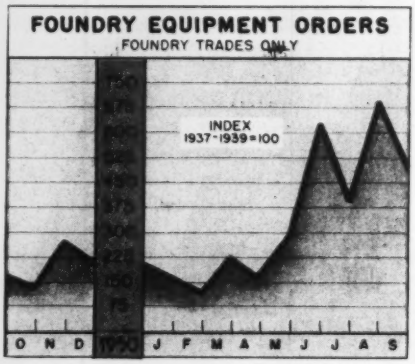
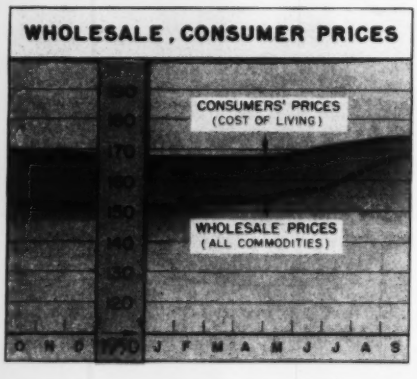

STEEL's INDUSTRIAL PRODUCTION INDEX
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
220 210 200 190 180 170 160 150 140 130 120 110
1950
1949
Latest Week* 222
Previous Week 222
Month Ago 220
Year Ago 119
Two Years Ago 188
WEEKLY AVERAGE, 1936-1939 100
Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 20%.
Copyright 1950 STEEL

Week ended Oct. 28 (preliminary).







Charts—Copyright 1950, STEEL

Industrial Production Index

	Total Production		Iron, Steel		Non-ferrous	
	1950	1949	1950	1949	1950	1949
Jan.	183	191	203	228	179	184
Feb.	181	189	201	232	188	185
Mar.	187	184	205	233	199	183
Apr.	190	179	222	219	196	168
May	195	174	226	204	195	145
June	199	169	231	177	207	132
July	196	161	208	156	203	128
Aug.	209	170	236	178	209	141
Sept.	211	174	244	179	211	157
Oct.	....	166	....	103	....	164
Nov.	....	173	....	144	....	163
Dec.	....	180	....	198	....	165
Avg.	....	176	....	187	....	160

Federal Reserve Board

Foundry Equipment Orders

	Index		Value in Thousands	
	1950	1949	1950	1949
Jan.	159.3	149.9	$731	$694
Feb.	113.1	144.4	519	668
Mar.	225.2	190.8	1,034	883
Apr.	160.6	172.0	737	797
May	294.9	121.9	1,353	565
June	622.7	164.9	2,858	764
July	401.8	146.6	1,844	679
Aug.	693.6	127.1	3,183	589
Sept.	483.8	166.6	....	772
Oct.	....	133.5	....	618
Nov.	....	270.4	....	1,250
Dec.	....	201.0	....	929

Foundry Equipment Mfrs. Assoc.

Price Indexes

	Wholesale		Consumers	
	1950	1949	1950	1949
Jan.	151.6	160.5	166.9	170.9
Feb.	152.7	158.1	166.5	169.0
Mar.	152.6	158.4	167.0	169.5
Apr.	152.9	156.9	167.3	169.7
May	155.9	155.7	168.6	169.2
June	157.3	154.4	170.2	169.6
July	162.9	153.4	172.5	168.5
Aug.	166.3	153.0	173.0	168.8
Sept.	169.5	153.6	173.8	169.6
Oct.	....	152.2	....	168.5
Nov.	....	151.6	....	168.6
Dec.	....	151.3	....	167.5
Average	....	154.9	....	169.1

Bureau of Labor Statistics

Issue Dates of Other FACTS and FIGURES Published by STEEL:

Construction Oct.23	Ironers Sept.25	Refrigerators Oct.23
Employ., Metalwkg..Oct.23	Machine Tools Oct.30	Steel Cast. Oct.23
Employ., Steel Oct.23	Malleable Iron Oct.30	Steel Forgings ....Oct. 30
Freight Cars Oct.16	Pump Orders Oct.16	Steel Shipments Oct.30
Furnaces, Indus. ...Oct.16	Purchasing Power ..Oct.2	Trucks, Elec. Ind. ..Jan.2
Furnaces, W. Air...Oct.16	Radio, TV Aug.14	Wages, Metalwkg...Oct.23
Gear Sales Oct.16	Ranges, Elec. Oct.30	Washers Oct.9
Gray Iron Oct.30	Ranges, Gas.....Oct.2	Water Heaters Oct.16

FRB Index Still Climbing

Industrial activity moved at a rapid pace in both September and October, the Federal Reserve Board says. Its index for September advanced to 211 per cent of the 1935-1939 average from 209 in August and a further increase is expected when October's results are tabulated.

Larger output of iron and steel, machinery and crude petroleum pushed the index to its new high in September. Expanded output of steel, durable goods and military equipment are expected to be the big factors in October's index.

In its summary of business conditions FRB reports industrial activity, employment and payrolls increased "somewhat further" in September and early October. Business and consumer demands were less active after mid-September and wholesale commodity prices showed little change.

Prices Near Peak

Both the wholesale and the consumers' price indexes moved higher in September and fell only a little short of alltime highs, Bureau of Labor Statistics reports. The consumers' price index for Sept. 15 reached 173.8 per cent of the 1935-1939 average, only 0.4 per cent below the alltime high set in August and September, 1948. It was 0.5 per cent higher than on Aug. 15 and 2.5 per cent higher than in September, 1949. A small drop in food prices was offset by gains in all the other index components.

The bureau's comprehensive monthly wholesale price index for September moved 1.9 per cent above the August level to 169.5 per cent of the 1926 average. All major groups that compose the wholesale index moved up, only fuel and lighting materials advanced less than 1 per cent.

The Business Trend

An increasingly popular watchword among metalworking companies is "get into a program." DO rated and directed programs will take a healthy slice of already tight metals

HARVEST time for industry brings a bumper crop of government directives. After a slow start defense plans are materializing and directives are heading out of Washington in a steady stream. Many companies are beginning to feel that they had better "get into a program" as NPA orders bite into the metal available for consumer activity. This bite will be bigger than originally indicated by Washington spokesmen because "directed" programs in addition to DO programs are shaping up to be pretty big.

Opposition to economic controls is voiced by interested parties in many industries and perhaps NSRB Chairman Symington is right when he says that everyone favors controls except those that affect his industry. It appears, however, that the transition from civilian production to a fractional war economy will not be accomplished without some difficulty. Durable goods producers fear that unless military orders get going very fast there will be a gap during which there will be some unemployment under current government regulations. Some of these fears may never be realized but it is true that military order placement is still not much faster than it was before the start of this fiscal year.

Metalworking companies generally had a big third quarter. Earnings were at or near record levels and only provisions for bigger income taxes that were taken out of third quarter earnings kept the net from going higher. The carry-back provision on excess profits taxes might take some of the glow from these earnings statements, depending on the base used by Congress when the law is finally passed.

Index at Crest . . .

In the week ended Oct. 28 STEEL's industrial production index matched the alltime high attained in the preceding week. High activity in all four components kept the index in the latest week reported at a preliminary 222 per cent of the 1936-1939 average.

High but Not a Record . . .

Steel mills continue to operate at a rapid pace but last week they didn't set a new record for output of steel for ingots and castings. The operating rate was about the same as in the week ended Oct. 25 when it was 102.5 per cent of rated capacity. Since these steel operating rates are only an estimate of production during a particular week, it is difficult to say with any degree of certainty just what the difference in output is from week to week. It is safe to say that steelmakers are pushing their furnaces to the limit in an effort to keep up with demand.

Autos Still Roll . . .

Throughout October the automotive industry kept its production lines rolling in high gear and went into November with no noticeable slackening. Problems for the industry are many and an eventual cutback in production may not be entirely unwelcome. A person can get pretty tired of staying on a merry-

BAROMETERS of BUSINESS

		LATEST PERIOD*	PRIOR WEEK	MONTH AGO	YEAR AGO
INDUSTRY	Steel Ingot Output (per cent of capacity)†	102.5	102.0	101.0	9.5
	Electric Power Distributed (million kilowatt hours)	6,562	6,503	6,503	5,433
	Bituminous Coal Production (daily av.—1000 tons)	1,958	1,917	1,902	412
	Petroleum Production (daily av.—1000 bbl)	5,895	5,902	5,903	5,075
	Construction Volume (ENR—Unit $1,000,000)	$245.1	$260.7	$244.8	$135.8
	Automobile and Truck Output (Ward's—number units)	187,525	188,323	187,030	137,651
	*Dates on request. †1950 weekly capacity is 1,926,803 net tons. 1949 weekly capacity was 1,843,516 net tons.				
TRADE	Freight Car Loadings (unit—1000 cars)	885†	891	880	591
	Business Failures (Dun & Bradstreet, number)	160	165	148	221
	Money in Circulation (in millions of dollars)‡	$27,121	$27,228	$27,060	$27,328
	Department Store Sales (changes from like wk. a yr. ago)‡	+3%	+11%	+10%	−14%
	†Preliminary. ‡Federal Reserve Board.				
FINANCE	Bank Clearings (Dun & Bradstreet—millions)	$16,084	$15,431	$16,262	$13,030
	Federal Gross Debt (billions)	$256.9	$256.7	$256.8	$256.6
	Bond Volume, NYSE (millions)	$19.3	$17.7	$17.9	$17.2
	Stocks Sales, NYSE (thousands of shares)	11,018	10,883	10,659	7,706
	Loans and Investments (billions)†	$68.8	$68.7	$69.5	$66.4
	United States Gov't. Obligations Held (millions)†	$33,580	$33,358	$34,869	$37,625
	†Member banks, Federal Reserve System.				
PRICES	STEEL's Weighted Finished Steel Price Index††	157.62	157.62	156.99	152.52
	STEEL's Nonferrous Metal Price Index‡	234.9	226.5	218.3	168.9
	All Commodities†	168.9	168.7	169.4	152.4
	Metals and Metal Products†	178.0	177.8	176.4	167.1
	†Bureau of Labor Statistics Index, 1926=100. ‡1936-1939=100. ††1935-1939=100.				

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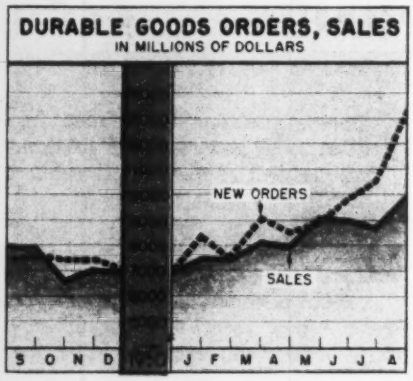
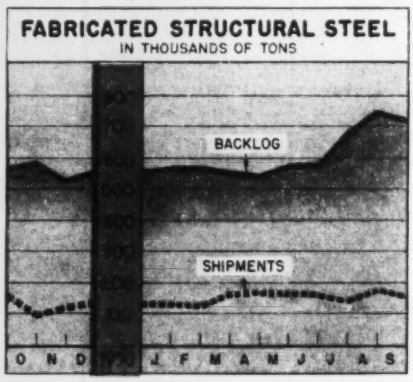


Durable Goods Orders, Sales

In Millions of Dollars

	New Orders		Sales*	
	1950	1949	1950	1949
Jan.	8,377	6,706	7,471	7,550
Feb.	7,513	6,734	7,461	7,757
Mar.	9,075	7,185	8,127	7,805
Apr.	8,531	6,127	7,956	7,445
May	8,909	5,993	9,089	7,488
June	9,814	6,544	9,030	7,745
July	10,553	6,195	8,670	7,207
Aug.	13,342	7,407	9,975	7,387
Sept.	....	7,634	....	7,335
Oct.	....	7,432	....	6,542
Nov.	....	7,402	....	7,041
Dec.	....	7,019	....	6,960

* Seasonally adjusted. U. S. Office of Business Economics

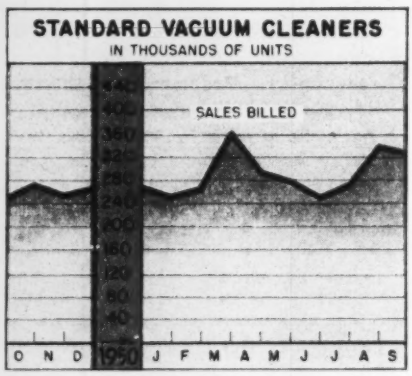


Fabricated Structural Steel

Thousands of Net Tons

	Shipments		Backlog	
	1950	1949	1950	1949
Jan.	135.2	152.7	565	675
Feb.	129.6	145.9	565	683
Mar.	156.8	185.9	556	582
Apr.	164.4	179.2	540	628
May	168.1	171.1	578	599
June	172.1	172.3	580	583
July	140.9	148.0	684	605
Aug.	180.2	183.9	741	583
Sept.	156.0	162.1	716	562
Oct.	....	99.8	...	584
Nov.	....	117.2	...	527
Dec.	....	135.5	...	555
Total	....	1,853.5	...	...

American Institute of Steel Construction



Standard Vacuum Cleaners

Sales Billed—Units

	1950	1949	1948
Jan.	249,150	228,769	304,273
Feb.	263,515	241,267	311,448
Mar.	361,014	309,897	355,415
Apr.	292,664	252,656	306,588
May	278,645	222,850	276,657
June	250,190	207,354	256,071
July	279,967	161,920	229,537
Aug.	341,232	219,909	237,202
Sept.	327,524	250,036	280,084
Oct.	.....	272,520	281,573
Nov.	.....	253,516	255,080
Dec.	.....	265,513	273,890
Total	.....	2,886,514	3,360,859

Vacuum Cleaner Manufacturers Assoc.

Charts—Copyright, 1950, STEEL

go-round after a while. A shortage of steel to maintain production schedules at their present pace is fairly widespread throughout the industry. Not only the independents are being affected as some might think. Ford and Chrysler among the auto industry's giants are scrambling for enough to keep going.

Industrial Building Up . . .

Engineering construction awards in the week ended Oct. 26 totaled $245.1 million, 6.5 per cent more than the average week this year and 85 per cent above the corresponding week last year. Industrial building contributed $105 million of the total to set a record for this class of construction. Other types of private construction fell off, noticeably mass housing. Buick's $65 million plant, Lincoln-Mercury's $10 million assembly plant and Du Pont's $7.5 million chemical plant were the big contributors to the total. The cumulative total for all heavy engineering awards in the first 43 weeks this year is up to $9.9 billion, an alltime record and 48 per cent higher than the corresponding volume a year ago.

Failures Lower . . .

Business failures declined 18 per cent in September to 648, the lowest level since January, 1949. Dun & Bradstreet says the liabilities as well as the number of failures fell off in September. Total current liabilities of $15,254,000 were involved, the smallest volume in two years. All industry and trade groups had a smaller number of casualties in September than in August.

Instrument Makers Ready

Industry has facilities to repeat or better output peaks attained during war

PROCESS control instrument orders for the first eight months of 1950 climbed from a postwar low to a steadily increasing production that reached a new peak in the third quarter. In the last three months incoming orders exceeded the highest comparable period during the war years by about 5 per cent. These facts were reported by the Scientific Apparatus Makers Association's executive committee at the mid-yearly meeting of the Recorder-Controller section.

Faced with this business influx industrial process control instrument makers are ready to repeat or better the emergency production peaks they made in World War II. While indicating high optimism concerning their ability to successfully provide for defense while maintaining a high output level for consumer goods manufacturers, the instrument men hesitate to make definite predictions. Too many "ifs" still enter the priority allocation, inventory, wage and price situations to permit more than a guess on what lies ahead.

The overall rise in process control instrument orders is said to be a reflection of a widespread demand to offset increased material costs and operation costs and losses. Manufacturers having gone through a transition period from hand operations to mechanization now are striving to attain the technological improvements of mechanization.

Business is expected to remain at or above present levels for the rest of this year and into 1951. The industry's present troubles come from lack of material and the prospect of losing invaluable engineers and mechanics.

Utilities Aid Westinghouse

Large orders for generating equipment placed by electric utilities are a big factor in high activity at Westinghouse Electric Corp., Pittsburgh. President Gwilym A. Price says in the first nine months this year three times as much generating equipment was ordered from Westinghouse as in all of 1949. Anticipating growing requirements for electric power for both military and civilian needs, he continues, this industry is placing steam turbine orders for delivery as far ahead as 1953.

During the war when the nation's steam turbine manufacturing capacity was devoted almost entirely

to providing the main drives for naval and merchant vessels, Mr. Price explains, the utility industry was able to meet demand only by the most careful management and by a far-sighted system of interconnections for "borrowing" power to meet peak loads. Vessels now in mothballs make it unlikely that a ship building program comparable to that of World War II will be necessary, he believes, and expanded manufacturing facilities can handle any foreseeable demand for both land and marine turbines.

Credit Curbs Won't Cut Spending

Sales of lower priced home furnishings will increase sharply because of government curbs on installment buying, predicts Benjamin A. Ragir, president of Ekco Products Co., Chicago manufacturer of more than 2000 houseware items.

Mr. Ragir says, "The new restrictions will act mainly to re-channel the consumer dollar. Money that previously went into cars and homes will be put into lower priced household conveniences." He doesn't think the 15-month credit limit will substantially lower consumer spending. "The American public is now in a buying cycle and will put more of its money into items for the home which are unaffected by the restrictions."

Cleaner Sales Surpass All 1949

Factory sales of standard-size household vacuum cleaners passed the total for all 1949 sometime in October. Sales in the first nine months totaled 2,643,901 units and were 26.2 per cent higher than in the like period last year, the Vacuum Cleaner Manufacturers' Association says. Total for all 1949 was 2,889,518.

Sales in September totaled 327,524 vacuum cleaners, down 4 per cent from the 341,232 units in August but 31 per cent above the 250,036 cleaners sold in September, 1949.

Orders Keep Coming

New business continues to come in at a rapid pace and has shown no measurable letup since the post-Korea peak, reports Greenfield Tap & Die Corp., Greenfield, Mass. In an effort to keep its backlog down to reasonable proportions the company added a second turn and is working some departments overtime.

New orders are coming in at a rate at least 40 per cent above a year ago. Company's gage business is running about 50 per cent above a year ago but is still considerably below the wartime peak.

Bearing Volume Stays High

Demand for Cleveland Graphite Bronze Co.'s products continues heavy from the automotive, aircraft, farm equipment, diesel engine and electrical appliance industries. A 32,000 square foot addition to the main Cleveland plant is being constructed for expansion of aircraft engine bearing production which has been stepped up from $200,000 to over $300,000 per month and is being further increased.

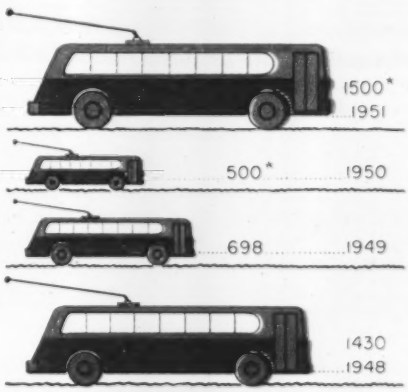
Sales in the first nine months totaled $30,011,065 and net profit was $3,052,394, compared with a net profit of $2,164,933 on sales of $22,363,157 in the like period a year ago. The third quarter was the best this year as sales reached $10,981,126, yielding a net of $1,228,474.

Trackless Trolley Output Picks Up Speed

ORDERS placed in the past weeks made a big change in the trackless trolley picture. Deliveries on most of the 800 trackless trolleys ordered plus a considerable backlog will not start until after the first of the year. Output this year will be only 500 units but next year deliveries are expected to climb to more than 1500 units for the best total since the war (see chart).

Next Year Looks Good

. . . Orders Assure Delivery Peak



* Estimated. Shipments in units.

These orders were placed by transit companies in the United States and Canada to effect operating economies and to guard against any possible emergency should liquid fuel face rationing. The largest order was the one placed by the Chicago Transit Authority for 349 trolley coaches with Marmon-Herrington Co., Indianapolis. Other orders include: Detroit, 80 to St. Louis Car Co.; Boston, 90 to Pullman-Standard Car Mfg. Co., Worcester, Mass.; San Francisco, 60 to Marmon-Herrington and 70 more to be awarded this month; Birmingham, 63 to Pullman-Standard; Philadelphia, 50 to Marmon-Herrington and 50 more to be awarded soon; Cincinnati, 45 to Marmon-Herrington; Denver, 35 to Marmon-Herrington; and Wilkes Barre, 5 to ACF-Brill, Philadelphia.

Question & Answers—Like many other industries trackless trolley builders are up against the problem of their relative importance in a defense economy. Orders aren't any good if they can't get materials to fill them. Defense authorities have indicated that the public transit industry will soon be designated as essential and the Labor Department has already placed the industry in an exempt position for certain manpower classifications.

The belief exists that streetcars and trolley coaches will be given a particular nod because they use electric power which has never been rationed. Experience in World War II showed the importance of adequate public transportation to production and it isn't likely that this industry will be left out in the cold again. Should military needs grow even larger, gasoline and diesel powered vehicles may be in a pinch for fuel and electric powered vehicles may present a happy solution.

Not Worried—Materials for building the vehicles on order books aren't causing any worry. If the industry gets the green light from Washington, suppliers expect to be able to meet manufacturers' requirements. There will be temporary shortages and some artful scheduling may be necessary at times to overcome the problems.

Should any form of fuel rationing be necessary the transit companies' job will be a tremendous one. Prior to World War II the public transit industry carried an average of 13 billion passengers yearly. During the war years this figure jumped to 23 billion and industry leaders estimate that tire and gasoline rationing would send the total to 26 billion at the present time.

Trolley coaches in service prior to the war totaled only 2000. By the time 1951's deliveries are complete it will be nearly 10,000. On a percentage basis trolley coaches have increased far more rapidly than any other form of public transportation and manufacturers believe the future holds promise that it will continue to push upward.

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Men of Industry

R. H. McPEAKE
. . . appointed sales mgr., Aldrich Pump

HERMAN D. ROWE
. . . to head Ford's Cleveland engine plant

H. STURGIS POTTER
. . . Carpenter Steel gen. sales mgr.

R. H. McPeake was appointed sales manager of **Aldrich Pump Co.,** Allentown, Pa. He had eight years' oil field experience with Standard Oil Co. of New Jersey in Latin America. In 1938 he joined Oil Well Supply Co. where he became export sales manager. After service in the Navy, in 1945 he became a partner in an industrial engineering and importing firm in Buenos Aires, S. A., representing American manufacturers.

David Round & Son, Cleveland, manufacturer of hoisting equipment, appointed **W. J. McSherry** as sales manager. He has been with the company 12 years as district sales represensative and more recently as assistant sales manager. **W. G. Holley,** formerly sales manager, was promoted to general manager.

George W. Parkin, since 1943 division manager at Trenton, N. J., for **National Automotive Fibres Inc.,** Detroit, was appointed assistant sales manager of the company's automotive division. He will have headquarters in Detroit.

Ernest C. Britton, formerly director and general manager, Plume & Atwood Mfg. Co. in Waterbury, Conn., was appointed vice president, **Theodore W. Foster & Bro. Co. Inc.,** Providence, R. I. He will co-ordinate all engineering, production and sales activities of the company.

Gerotor May Corp., Baltimore, elected **J. M. Schiavetti** as vice president in charge of production. Formerly purchasing agent, Mr. Schiavetti has been in charge of manufacturing since 1948.

Herman D. Rowe was appointed manager of **Ford Motor Co.'s** new engine plant under construction in Cleveland. Since early this year Mr. Rowe has been assigned as a co-ordinator to work with central staff managers in setting up new motor plants in the Rouge and at Cleveland. He has been employed by Ford since 1934 and since 1945 has held various supervisory jobs in the Rouge plant.

Allied Research Products Inc., Baltimore, appointed **R. A. Hoffman** as director of research. Mr. Hoffman joined Allied Research in February of this year, having previously been with E. I. du Pont de Nemours & Co. Inc. as a research chemist and was president of R. A. Hoffman Chemical Co., Cleveland. As director of research Mr. Hoffman will head up Allied exploratory activities in development and perfection of new additions to the line of Iridite coatings for corrosion resistance and ARP plating chemicals.

Raymond T. Porter was appointed eastern sales manager, **Heppenstall Co.,** Pittsburgh, supervising die block, shear knife, tongs, rings and other forging sales throughout the company's Boston, Bridgeport, Conn., New York and Philadelphia sales districts. He will have headquarters in Bridgeport. Mr. Porter was made sales manager of Heppenstall in 1937.

Gerrard Steel Strapping Co., subsidiary, U. S. Steel Corp., Chicago, elected **William B. Renois** as sales vice president succeeding **S. G. Adolf Larsen,** who was appointed assistant to the president. Mr. Renois was general manager of sales.

H. Sturgis Potter was appointed general sales manager, **Carpenter Steel Co.,** Reading, Pa., to succeed the late **R. V. Mann,** who had been vice president in charge of sales. Mr. Potter joined the company in 1936 as sales engineer in the Indianapolis territory. He later was assistant manager of tool steel sales in the Reading office, then manager of tool steel sales. In 1948 he was appointed sales manager in charge of Reading mill products.

Richard A. O'Connor was named chairman of the board, **Magnavox Co.,** Ft. Wayne, Ind. He is succeeded as president by **Frank Freimann,** executive vice president. **John D. Grayson,** comptroller, was elected vice president and comptroller.

Lucien R. Collart was elected secretary and treasurer, **E. W. Bliss Co.,** and will be located in the near future in the company's executive offices in Canton, O. He succeeds the late **E. S. McClary.**

Stuart H. Smith was appointed manager of industrial development, and **John H. Tipton** as Cincinnati district manager of **SKF Industries Inc.,** Philadelphia. **Emerson D. Ogle,** manager of the industry division, was advanced to assistant district manager at Cincinnati, and **B. K. Lathbury,** industry section supervisor, to assistant manager of industrial development.

Stig Cronstrom was appointed assistant to **Louis E. Pleninger,** vice president in charge of foreign sales for **American Type Founders Sales Corp.,** Elizabeth, N. J. Mr. Cronstrom will have charge of a new office in Stock-

ROGER ELIOT GAY

(Tenth and Present President of BRISTOL BRASS*)*

. . . Wartime and peacetime leader who put Bristol on the national Brass map . . .
Who modernized and humanized production, sales, and public relations . . .
Who achieved balanced distribution . . . Who first set and then met his own specifications for a "financially strong, physically healthy, and aggressive company"

Youngest president in Bristol history, Roger Gay took this chair (which he has hardly had time to sit in, since) in 1943, after several years as sales manager and vice president. Always willing to learn from older heads in the business, he stimulated ideas in the minds of his associates . . . and built more and more solidly on the foundations laid by the nine preceding presidents.

In the war years, he served on any committee or any organization that would help the Brass industry to do a better job for the armed forces. And when the war ended he went out and worked with the salesmen on the road, learning how to sell all over again. In the process, he balanced the sales set-up, improved and increased distribution of Bristol Brass sheet, rod and wire . . . established new warehouses and sales offices . . . built a new school of sales trainees . . . and, in many other ways, made Bristol Brass a young, aggressive, hard-hitting, fast-moving organization . . . with (as has so often been said) *not an ounce of stuffing per shirt!*

Today, Bristol has a modern establishment, with a continuous casting machine in daily operation, and a new 4-high mill about to be installed. So it goes the same way today as it did 100 years ago . . . *but even more so* — for if you want your Brass fast, right, and with no red tape, you can get it that way here — *faster and better than ever before!*

One Hundred Years of BRASS made "BRISTOL FASHION"

Like the world-famed merchant ships from Bristol, England . . . Always prompt, shipshape, reliable

The BRISTOL BRASS CORPORATION, *makers of Brass in Bristol, Conn. since 1850*

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holm under the name of ATF European Service.

C. Edwin Ponkey was appointed general manager, **International Derrick**

C. EDWIN PONKEY
. . . general mgr., Ideco Columbus division

& Equipment Co., Columbus division, Columbus, O. He resigned as vice president of Sheldrick Mfg. Corp. to accept this position. Mr. Ponkey succeeds **Ferguson Barnes**, who resigned from the division as vice president and general manager.

Gilbert H. Scribner was elected a director of **International Business Machines Corp.**, New York.

Wayne E. Williams was appointed western district manager, **Tube Turns of Canada Ltd.**, with headquarters at Edmonton, Alta., Canada. He will provide factory information and counsel to designers, erectors and users of welded piping.

Wolverine Tube Division, Calumet & Hecla Consolidated Copper Co. Inc., Detroit, named **Buel A. Devine** commodity sales manager. He will be in charge of tube sales to wholesalers and jobbers.

Thomas E. Skilling was appointed Pittsburgh district sales engineer, **Edward Valves Inc.**, East Chicago, Ind., subsidiary of Rockwell Mfg. Co. As Edward representative in the area he succeeds the Herr-Harris Co. with which he has been associated for several months. He continues his office at 545 William Penn Pl., Pittsburgh.

William W. Monahan was appointed vice president in charge of industrial relations for **Kaiser-Frazer Corp.**, Willow Run, Mich.

C. W. Prosser, works manager, **Iron City Spring Co.**, Pittsburgh, was elected to the board of directors to fill the vacancy created by the death of **Walter S. Laird.**

John M. Dooley was named sales representative throughout eastern Tennessee for the boilers, radiators, convectors and heating specialties of **National Radiator Co.**, Johnstown, Pa. He will be associated with the company's branch sales office, Richmond, Va.

Rollin B. Plumb, formerly vice president in charge of sales, Eagle Lock Co., Terryville, Conn., joined **Russell, Burdsall & Ward Bolt & Nut Co.**, Port Chester, N. Y., in an executive capacity.

M. S. Klinedinst was appointed manager, industrial equipment sales section, RCA engineering products department, **Radio Corp. of America**, New York. He succeeds **P. B. Reed**, recently named vice president in charge of the government service division of the RCA service company. Mr. Klinedinst was formerly manager of the scientific and industrial equipment sales section, RCA international division.

Dr. John W. McNall was appointed division engineer, research department, **Westinghouse Electric Corp.'s** lamp division in Bloomfield, N. J. **William C. Lilliendahl** was named research advisory engineer for that division. **Peter G. Schmitt** is manager, specialty division, Westinghouse Electric International Co.

Frank G. Drake was appointed general sales manager, **Bede Products Inc.**, Cleveland. He will succeed **Richard E. Estabrook**, who was promoted to general manager. Mr. Drake will handle expanded sales, sales promotion and advertising activities. Formerly eastern district sales manager, Mr. Drake has had over 35 years of experience in the finishing field.

Carboloy Co. Inc., Detroit, appointed **I. L. Wallace**, formerly superintendent, carbide metal division, as manager of engineering on both carbide and other special metals. **J. A. Muldoon**, superintendent, carbide fabricating division, was promoted to manager of manufacturing for carbides and other special metals. **R. L. Brownlee**, production manager on carbides, will act in the same capacity for other special metals. **F. C. Ritner**, in addition to his responsibilities as vice president in charge of research, will assist **E. F. Wambold**, executive vice president, in a general administrative capacity.

Dr. Rudolph Zillman is now associated with **Pittsburgh Steel Foundry Corp.**, Glassport, Pa., as a metallurgist.

Alfred E. Emms, plant superintendent for **Acheson Colloids Corp.**, New York, has retired after 47 years with the company.

William P. Newdome was appointed sales engineer, **Furnace Engineers Inc.**, Pittsburgh, designer and builder of industrial furnaces.

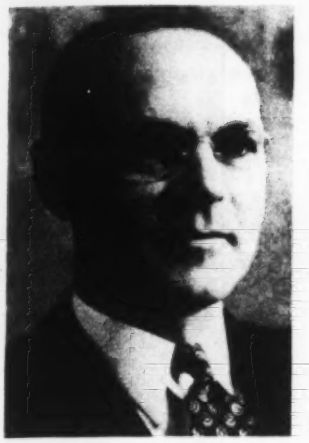
C. I. Hayes Inc., Providence, R. I., appointed **Dr. Tracy C. Jarrett** as its midwest representative for industrial heat-treating equipment. He will have headquarters in Denver.

Twin Disc Clutch Co., Racine, Wis., appointed **Paul W. Wahler** as service manager, and **Robert A. Harmon** as dealer sales supervisor. They will have headquarters in Racine.

Kenneth Fox, formerly a vacuum metallurgist with National Research

FRANK G. DRAKE
. . . general sales mgr., Bede Products

RICHARD E. ESTABROOK
. . . promoted to gen. mgr. of Bede Products



AUSTIN C. ROSS
. . . new vice president, Worthington Pump

ARTHUR P. WILSON
. . . joins Trundle Engineering Co.

WILLIAM T. KELLY JR.
. . . president, American Brakeblok Division

Corp., joined **Kinney Mfg. Co.**, Boston, as sales application engineer.

Austin C. Ross, manager of the Buffalo works of **Worthington Pump & Machinery Corp.**, Harrison, N. J., was elected a vice president. He will continue to serve as Buffalo works manager. He joined the company in 1932 as assistant general purchasing agent, became assistant works manager at Buffalo in 1935 and works manager in 1940.

Lawrence M. Rich was elected a vice president, **Plomb Tool Co.**, Los Angeles.

Emil F. Frey, assistant sales manager, was promoted to director of sales promotion and advertising for **DeVilbiss Co.**, Toledo, O. **Henry M. Kidd,** assistant sales manager, becomes sales manager of spray equipment sales. **Don E. Fenstermaker** is sales manager, perfume and medicinal atomizers, pioneer division of the company. **John M. Ehni** was made export manager and branch plant co-ordinator.

Hodge C. Morton was named director of sales, **Automatic Washer Co.**, Newton, Iowa. He has spent nearly 20 years in the household appliance and home laundry equipment fields, most recently as head of contract sales division, Murray Corp. of America, Scranton, Pa.

Arthur P. Wilson, formerly vice president, Frank C. Brown & Co., New York management counselor, joined the staff of **Trundle Engineering Co.**, consulting management engineering firm of Cleveland, Chicago, New York and Washington. Covering the northeastern states initially, Mr. Wilson will handle special assignments for both Trundle and its affiliate, Trundle Associates Inc., organized last year.

A. A. Franks was elected president, **Samson-United Corp.**, Rochester, N. Y. **William J. Haggerty** is general manager. **Durwin D. Gillespie,** former president, is chairman of the executive committee and active in plant operations.

John M. Walsh Jr. was appointed division superintendent of blast furnaces at the Gary Works of **Carnegie-Illinois Steel Corp.**, Gary, Ind., subsidiary, U. S. Steel Corp. He succeeds **G. Paul Burks,** retiring because of ill health.

Warner Electric Brake & Clutch Co., Beloit, Wis., appointed **Roger H. Brown** eastern sales manager for its ICB division. Mr. Brown formerly handled engineering sales of the company's industrial clutches and brakes in the New York area, and is succeeded by **R. C. Wiard** and **W. E. Gregg** who will have headquarters in Middletown, Conn.

William T. Kelly Jr. was appointed president, **American Brakeblok Division,** American Brake Shoe Co., New York. In addition he continues as president of the Kellogg Division, manufacturer of air compressors and paint spray equipment. **Maynard B. Terry,** vice president, located at the division's headquarters in Detroit, continues in charge of Brakeblok sales.

Ray Mills, purchasing agent for **General Fireproofing Co.**, Youngstown, was named director of purchases succeeding the late **George R. Farrell,** vice president in charge of purchases.

John G. Holschuh was promoted to manager of ES-nail sales, **Elastic Stop Nut Corp. of America,** Union, N. J. He succeeds **Ken Davis,** appointed district manager of the Chicago office.

C. F. Gruenert, manager of the Detroit branch of **Inland Steel Products Co.**, Milwaukee, was named to succeed **A. E. Kirchgraber** as manager of the Rochester-Buffalo branch. **R. E. Wollert** succeeds Mr. Gruenert at Detroit.

Armco Drainage & Metal Products Inc., subsidiary of Armco Steel Corp., Middletown, O., appointed **D. E. Reichelderfer** controller succeeding **H. H. Tullis,** and **Fred L. Winslow** as assistant controller.

OBITUARIES . . .

W. W. Bowring, for many years sales engineer with **Frederic B. Stevens Inc.**, Detroit, and widely known throughout the foundry business, died at his home in Windsor, Ont., Oct. 30 of a heart attack. He was active with the Detroit Chapter, American Foundrymen's Society, since its inception in 1935 and served as chairman in 1948.

Julius S. Holl, 64, advertising manager of **Link-Belt Co.**, Chicago, for almost 40 years, died Oct. 24 after a prolonged illness.

George L. Christy, 83, former chief engineer, **Pittsburgh-Des Moines Steel Co.**, Pittsburgh, died Oct. 21.

Edwin G. Smith, 47, an engineer associated with **Amsler Morton Corp.**, Pittsburgh, since 1936, died Oct. 24 following a prolonged illness.

C. A. Metzloff, 60, chain superintendent, **Columbus McKinnon Chain Co.** plant in Tonawanda, N. Y., died at his home Oct. 14.

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Production AND Engineering NEWS AT A GLANCE

CONVEYING A MACHINE FUNCTION — Height of materials handling efficiency used to be considered reached when materials were taken to and away from processing machines on a mechanized basis (p. 84). But times have changed. High cost of labor and materials making a two-pronged attack on the manufacturer's "pocketbook" is driving conveying operations right into the machine itself. An outstanding example is provided by a duplex machine developed by Cincinnati Milling Machine Co. It combines both milling and handling in processing auto clutch housings. Nonproductive time is really reduced by the co-ordinated operations.

JOB FOR "METAL CHEFS"— Three alloys developed by Westinghouse for use in jet components are weighed, mixed and melted with a precision that allows no error greater than one-tenth of one per cent. They are produced in the East Pittsburgh alloy lab in pound lots so they can be processed through a battery of tests designed to ferret out the tiniest flaw. For jet use, only those that pass every analysis with a perfect score are shipped out for use. The alloys, called Discalloy, Refractaloy and K24B, must be so pure that a special furnace is required to melt them. Heat induced in the charge comes from electromagetic waves "beamed" from a water-cooled copper coil surrounding the furnace shell.

LOOK! NO DIALS— No measuring devices or human judgment are required in an oil mist system of lubrication developed by the Alemite Division of Stewart-Warner Corp., Chicago (p. 88). Besides cutting down lubricant consumption, the technique assures proper lubrication of a machine so long as it keeps running. Application of right amount of oil prevents "fluid friction", and the air delivering the mist helps keep bearing temperatures down. As a result machine speeds can be stepped up well over 10,000 revolutions per minute.

HOW MUCH STRETCH?— Percentage reduction of materials being processed through pairs of rolls turning at different speeds now can be automatically determined by means of a recording speed-ratio tachometer developed by Tagliabue Instruments Division of Weston Electrical Instrument Corp., Newark, N. J. The company says the changing speed ratio of the two rolls can be continuously recorded by the new development.

HOW'S YOUR "NOSE" FOR ALLOYS— If you are concerned about making the proper selection of cast heat resistant alloys for equipment operating at high temperatures, perhaps some of the suggestions presented by N. A. Matthews of Electro-Alloys, may be helpful (p. 90). He points out that there are many "right" and "wrong" choices to make especially in these days of strategic material shortages. But the picture is not too dark. He says such alloys today are subject to much closer production control than was the case 10 years ago. As a result, it is no longer true the more costly metals necessarily will provide the most economical service.

"SHAKES OUT" MACHINE TROUBLES — Mechanical and electrical parts of considerable size having an upper limit of 200 pounds force output over a wide variable frequency range of 3 to 500 cycles per second are tested by a vibration tester now in use in the environmental testing station of United States Testing Co., Hoboken, N. J. The new device shakes out the trouble spots in machinery by finding resonances excited by vibration forces during operation. Because the Armed Forces require vibration tests on materials purchased, the company says the equipment will aid manufacturers now supplying material to meet government specifications.

"JACK-OF-ALL-TRADES" MILL— Installation of American type specialty mills in most foreign countries would not be economically feasible (p. 96). They would operate only a few months of the year and would not produce the variety of products needed. In Chile, the new Concepcion mill—a modified Belgian type—is virtually a "jack-of-all-trades" unit processing angles, flats, narrow strip, skelp and rods with a minimum of hand labor. Its versatility is due to the reduced number of passes and the inclusion of two 14-inch, 2-high stands between the rougher and finishing stands.

OIL SALVAGING PAYS OFF— Because industrial petroleum products cost so little it would appear that salvaging oils would be a penny-wise and pound-foolish proposition. But this is not so according to Dean M. Cleaveland of Bendix Products Division, Bendix Aviation Corp., South Bend, Ind. He says that although unit cost of oils is low, in many shops the volume usage is such that salvage is an important economic factor. He says, it is obvious that when salvaging these products can mean a net saving of $10,000 per month in a plant employing about 8000, it is not only economically desirable by also a necessity. Furthermore, two additional benefits are derived. The salvaging helps conserve natural resources; also periodic processing reduces dermatitis among personnel.

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Duplex M

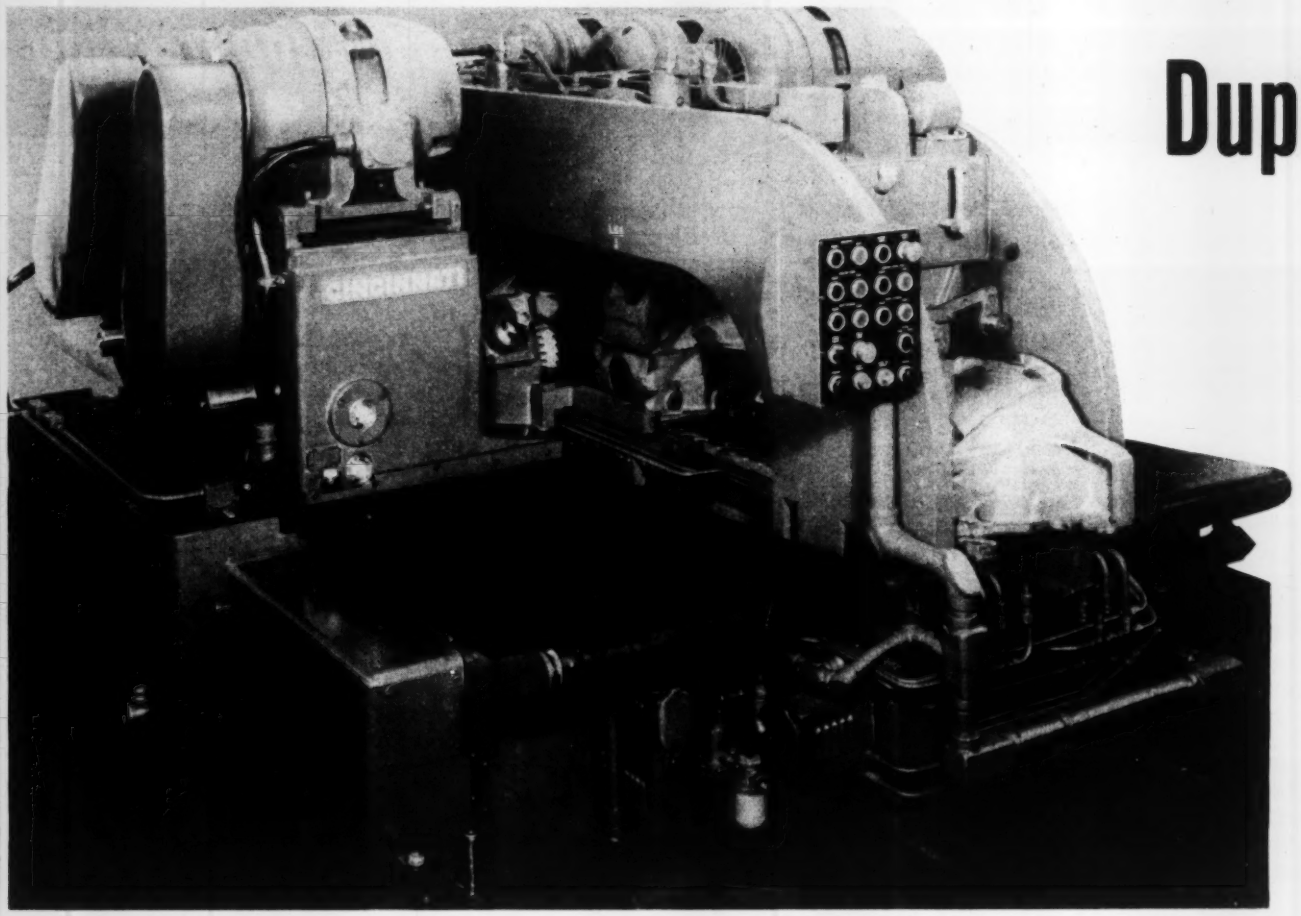


Fig. 1 (above) — "Operator's view" of duplex transfer milling machine running off a batch of clutch housings in final test at builder's plant. Castings are delivered to and removed from transfer mechanism by conveyor system

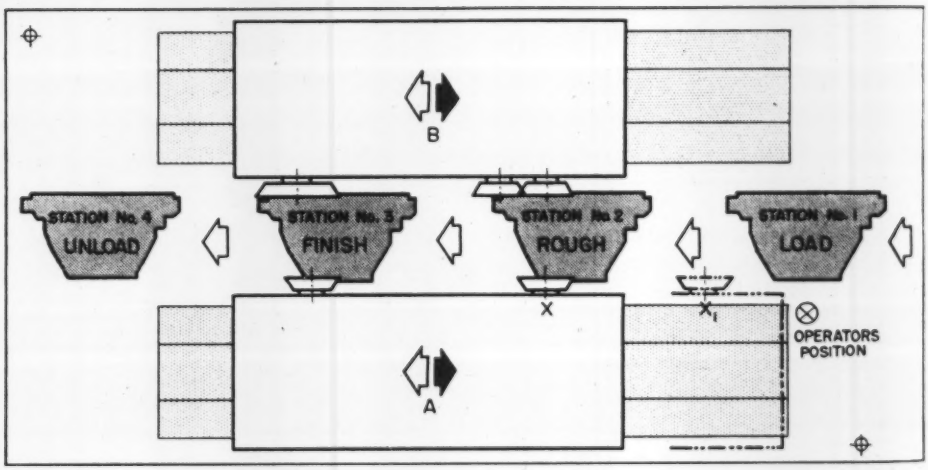
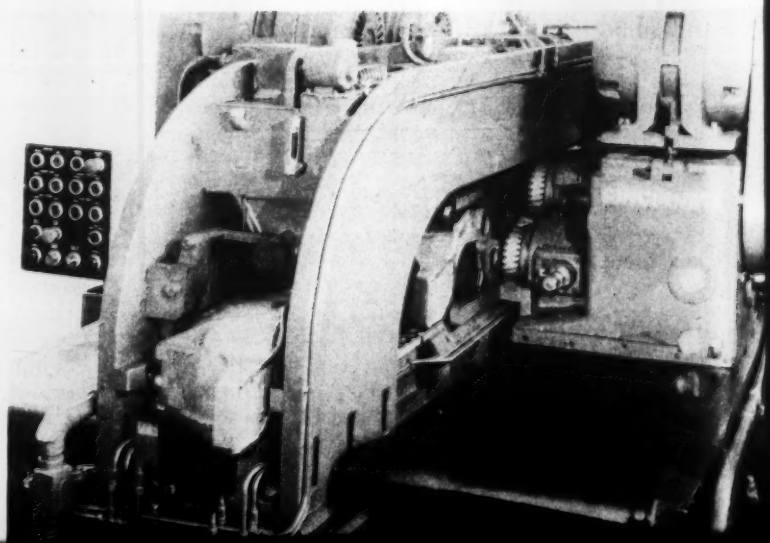


Fig. 2 (above) — Passage of castings through "work tunnel" and movement of milling heads, is shown by this machine diagram section as seen from overhead

Fig. 3 (right)—Right hand head in action on large ends of chuck housings, showing how two staggered roughing cutters clean off the pull surface. Hidden behind them is the 13-inch cutter which does the finishing



ex Machine Combines Milling and Handling

High cost of labor and materials is counteracted by high degree of mechanization in production machining automotive clutch housings

By JACK LOVINER
Applications Engineer
Cincinnati Milling Machine Co.
Cincinnati

FOR SEVERAL years there has been a trend toward increased use of "transfer-type" machine tools in mass production industries—particularly in the highly competitive automobile industry. This is one of the major influences in keeping direct labor costs within reasonable limits in the face of sharply increased hourly wages. Also, it can be explained as an extension of mechanized materials handling from production line conveyors into the machine tools in production lines—the "internal" and "external" conveyor systems that in many cases are being co-ordinated.

An interesting practical example of this "marriage of machine tool and materials handling" is provided by the Cincinnati duplex transfer milling machine illustrated here as it appeared on the builder's testing floor. This machine, Fig. 1, has been designed and tooled up for high speed rough and finish milling of both ends of two different varieties of cast iron, motor truck clutch housings. Only simple adjustments are required to shift production from one model to the other.

"Work Tunnel" Setup—Setup and cycling of this job is shown diagrammatically by Fig. 2, which is a sectional view looking directly down on the machine from above. As this diagram, as well as Figs. 1, 3 and 4 clearly indicate, the machine has two multiple spindle heads to right and left of a "work tunnel" which houses both the transfer and clamping mechanism.

With both heads retracted as shown by Fig. 1, a rough casting enters the work tunnel at station No. 1, Fig. 2. The rack-operated transfer mechanism thereupon takes matters in hand. First, it advances the casting to station 2, where it automatically is located and pneumatically clamped for rough milling of both ends. Then it is unclamped, pushed onto station 3, where it is relocated, reclamped and both ends finish milled. Following this it is released and pushed along to station 4 which is the unloading station.

As this is going on, a succession of other castings are following on through—these being brought to station 1, and removed from station 4 by production line conveyors as the machine now is installed in the user's plant.

Two Housing Ends Milled at Once — During the cutting phase of the cycle the transfer mechanism is inactive, the castings being locked in stationary fixtures on the bed while the four sets of face mills machine their way across the ends of the two housings at stations 2 and 3.

Cutting feed of the two traveling heads, which is in the direction indicated by the solid black arrows of points A and B, Fig. 2, is accomplished by rack traversing of the two heads in unison until all cutters have passed completely over the surfaces to be machined. For instance, the cutter marked "X" on the diagram, ends up at position marked "X_1".

Having reached the limits of their cutting traverse, the two heads simultaneously return to their starting positions. It is during this return traverse that the transfer and clamping mechanisms perform their functions of unlocking, advancing, and locking the workpieces—a rough casting entering the tunnel and a finished one emerging from the tunnel each time the "push" occurs.

Fast "Co-ordinated" Action — This co-ordinated action cuts the nonproductive time in the cycle to a minimum. The heads retract—and the transfer mechanism functions—at the rate of 250 inches per minute.

The following data on the setup of this "conveyorized" machine tool and its performance give clear indications of its operating efficiency. The two heads during their cutting traverse, move at the rate of 63 inches per minute. The two cutters on the left hand head—the head which machines the small ends of the clutch housings—are 8 inches in diameter. On the right hand head—the one shown in Fig. 3 and which deals with the big ends of the castings—there are two 8-inch roughing cutters staggered so that their paths overlap slightly, and one 13-inch finishing cutter which sweeps over the entire surface.

All cutters have carbide-tipped blades. The roughing cutters remove $\frac{1}{4}$-inch depth of cast iron at 255 feet per minute tooth surface speed. Finishing cutters remove 1/32-inch of material at 280 feet per

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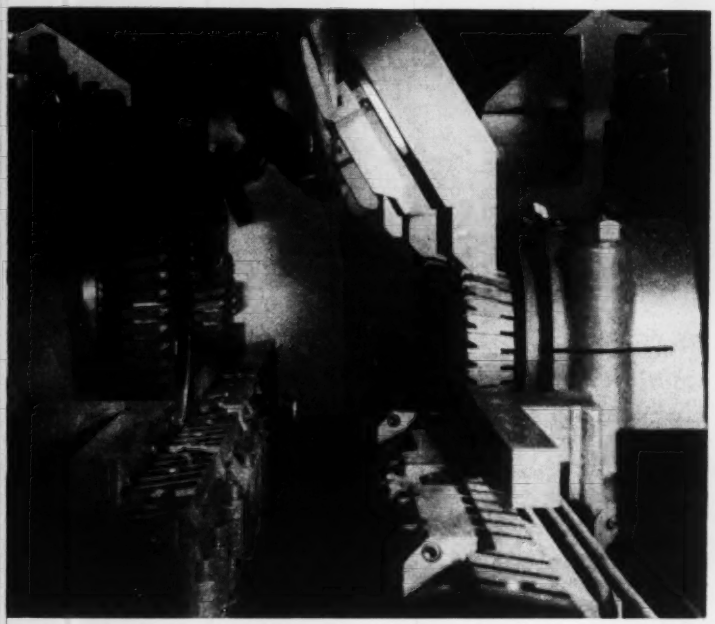

Fig. 4—View through the "work tunnel" from the discharge end, showing arrangement of cutters, self-cleaning supports for work, transferring, locating and clamping members and chip disposal trough

minute. The "down-milling" technique is employed, as can be deduced by the appearance of the cutter teeth in the illustrations. Output is 69 parts per hour on the clutch housings that are illustrated herewith.

"Window Shades" Keep Chips Clear—Fixtures are designed to be self-cleaning, a feature which is apparent in Fig. 4, which is a view looking through the work tunnel from the "discharge" end. Chips fall into the trough at the center of the tunnel, where they are picked up by a continuous chip conveyor which delivers them to a bin truck parked at the unloading end of the machine. Way covers which operate like roller window shades keep chips and scale off the surfaces on which the heads reciprocate. Action of these covers is clearly depicted in Figs. 1 and 3.

Manual labor involved in running this machine has been reduced to lowest terms. The operator stands at the left of the entering end of the machine, in front of the conveniently located control panel. His duties ordinarily are to see that each casting is correctly positioned at station No. 1, and to press the "pre-set" cycle button on the panel. If an incorrectly positioned casting should get by, the machine will stop automatically before any harm is done.

Nickel Plated Wire Now Can Be Cold Drawn

COLD DRAWING of heavy wire sizes on which a precoat of nickel has been deposited electrolytically is now feasible. The bond between the wire and the nickel is said to be perfectly stable; the wire can be bent, twisted, formed or redrawn without the coating loosening or flaking off,

A development of Kenmore Metals Corp., Jersey City, N. J., the process deposits a uniform coating of nickel with a smooth polished appearance; it has good resistance to rust and corrosion, as well as wear. In its production, care is taken to insure that the wire base is free of inclusions, pin holes, slivers and other surface or internal defects.

Wire Comes Clean—Along with these precautions in the condition of the metal itself, strict attention is given to the cleaning cycle prior to plating.

Nickel is plated directly on the steel wire without any intermediary deposit. Thickness of the coating may be as high as 0.002 or 0.003-inch, generally ample to meet corrosion resistance requirements. Coating thickness can be held to close specifications.

The nickel plating has no adverse effect on the drawing process. If the base metal is low carbon steel, conventional cold drawing methods for such steel are applied. According to Kenmore, the cost of redrawing the nickel-plated wire is no higher than that of drawing bare wire. It can be annealed in any conventional bright annealing furnace.

You Can Weld It, Too—Using the recommended procedures, the Fernicklon wire, as it is called, can be spot or butt welded. An advantage accruing from spot welding is the greater thickness or corrosion resistant nickel than the normal coating. Wire is offered in cold drawn round sections, as well as cold rolled flat wire with square or round edges, half-rounds and oval sections. Sizes range from 50 gage to 5/16-inch.

Manufacture of closely coiled helical springs is reaping some of the benefits of the process. When plated after forming, the springs received protection only on a part of the diameter. But by preplating the wire, the entire spring is coated uniformly and the possibility of hydrogen embrittlement is said to be excluded, as the wire is drawn to spring temper after plating.

What About Copper?—Nickel has also been plated on copper wire, as tube leads for the radio industry and for conductors where operating temperatures are higher than normal. Dumet, a 42 per cent nickel-iron alloy wire ordinarily made with a borated copper coating and used for glass-sealing in light bulbs and radio tubes as the core wire has the same coefficient of thermal expansion as glass and copper gives good conductivity, is also making use of the Kenmore-developed process.

This composite wire has been made by electrodepositing the necessary 22 per cent (by weight) of copper on a nickel-iron alloy core of 0.180-inch diameter, thus increasing the total diameter to 0.200-inch; bonded wire is then drawn in stages to the desired 0.016-inch size. Other applications include automobile radio antennas and various spring products where corrosion resistance is necessary to protect the base of high carbon steel.

SEEN AND HEARD IN THE Machinery Field

By GUY HUBBARD
Machine Tool Editor

METAL SHOW IN RETROSPECT: DeQuincy's famous essay on the discovery and development of roast pig, tells a fictional story scarcely less fantastic than the true story of the origin and development of heat treating of metals.

In the fantasy, a Chinese farmer in ancient times burned his fingers on the piping-hot carcass of his favorite pig, which he was attempting to drag from the ruins of his barn. Licking his fingers to ease the pain, he became conscious of a delicious taste which he finally was able to trace to the accidentally roasted pig.

As the news got around, pig sties all over China began to burn down. Not for a long time did it dawn on the people that better roast pig could be produced by much less destructive and more localized and better controlled fires than those of their burning farm buildings.

While it may not have been necessary to burn down a blacksmith shop to discover the possibilities of hardening, tempering and other forms of heat treatment, I certainly do recall that not so many years ago the goings on inside a blacksmith shop did involved an amount of fire, smoke, fumes and dirt out of all proportion to the end effect on the metal being processed. In those days no one wanted the blacksmith shop much closer to the production departments than the livery stable of a country hotel was to the dining room.

The thing which impressed me most at the recent Metal Show in Chicago was the extent to which "localized and exactly controlled heat"—oil, gas and electrical heat in particular—has "civilized" metal treating processes and made them "socially acceptable" along with machine tool and other production operations in the regular production lines. Not only is the heat localized, but also its cycle is exactly controlled by automatic instrumentation so that all the hocus pocus involved in unaided human judgment has been removed.

Old-time metal treaters did wonders with the crude equipment and crude materials and rudimentary knowledge which they had available. Like hand die sinkers, there were not enough of them even in their heyday. Only through mechanization of heat treating could today's conditions be met. From what I saw at the Metal Show, I am convinced that we have barely scratched the surface of the possibilities of "mechanized heat treating".

I venture to predict that it is destined not only to stand along side of machine tools, but is going to be combined into machine tools in many cases—and that at no very distant date.

PROFESSOR BUCKINGHAM SPEAKS: One of the high points of the meeting of American Gear Manufacturers Association was the informal talk given by one of this country's leading exponents of scientifically correct gearing, at the closing session.

Unlike the usual closing session, this one was heavily attended—an additional tribute to the man who the evening before had received the Edward P. Connell award "in recognition of his many years of service to the gearing industry as teacher, student and author and as one whose work has had widespread influence on the design, application and the use of gears."

Earl Buckingham, graduate of Annapolis, distinguished Army Ordnance officer in World War I, former chief metrologist of Pratt & Whitney division, Niles-Bement-Pond Co., and currently professor of mechanical engineering at Massachusetts Institute of Technology, warned against blind acceptance of laboratory tests as foundations for designs.

The wide range of variables—including mysterious "subsurface failures" due to machining strains—make the final proof of a design what can be called the "road test".

The inference that is to be drawn is that mathematical and laboratory work, plus common sense and ingenuity, plus the old American custom of "giving the mechanism the works" under operating conditions, is the way to insure something that is safe, sure and long lived. This mixture of sound theory and solid craftsmanship, without blind reliance on either one alone, is one of the secrets of success of the American industrial system.

TOOL AND DIE GENIUSES: At time of writing this I am attending the annual meeting of National Tool and Die Manufacturers Association being held in Cleveland.

This association is made up of some of the most useful "rugged individualists" that we have in this country today. They are the men who not only have to make the basic tools which make realities of the airbrush dreams of industrial designers, but also they must quote prices on these tools which insure the getting of orders from hard headed manufacturers—and at the same time insure against the loss of their own shirts in the process.

Even to a greater degree than patternmakers, these tool and die men make possible the making of things of which manufacturers themselves in many cases have no very clearly preconceived production ideas. It is a far cry from rough die blocks to a finished die set which will press a sheet of metal into some intricate three-dimensional shape — an automobile hood for example.

All the rules in the book can't take the place of the years of experience of these industrial geniuses who make the tools that multiply industrial art by the thousands and also subdivide its cost proportionately.

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Oil-Mist System Cuts Lubricant Consumption

Lubrication technique which eliminates the human factor reduces bearing temperatures to permit stepped-up machine speeds, well over 10,000 rpm

VIRTUAL elimination of the human factor in lubrication, drastic economy in lubricant consumption and prolonged bearing life are some of the plus features of the Alemite oil-mist system for constant and automatic delivery of lubricating oil to all types of machine bearings in "air-borne" microscopic particles through tubing.

In addition, reduction of bearing temperatures, permitting stepped-up machine speeds; prevention of product spoilage by complete elimination of drippage and elimination of machine down-time for lubrication are also seen for the system developed by Alemite Division of Stewart-Warner Corp., Chicago.

F. A. Hiter, Alemite's senior vice president, states that lubrication of each bearing is accomplished without measuring devices. Lubrication cycles are eliminated and maximum machine efficiency is realized. Oil-mist oil delivery is constant and automatic whenever a machine is in use, and the only volume determinant is the bearing requirement. A fresh, constantly replenished supply is present in the bearing so long as the machine is running.

Bath Cools and Protects—Both coolant action and protection against dust and abrasives on bearing surfaces are provided by the system. The cooling action arises from two conditions. One is application of just the right amount of oil, preventing "fluid friction." The second is the air which passes through the bearing to deliver the mist. The pressure of the air carrying the mist is slightly greater than atmospheric pressure. Thus dust, abrasives or other harmful matter in the atmosphere are kept out.

The system's lubricator, attached to each machine, is slightly smaller than an auto's oil filter. In operation, there are no moving parts. Only two controls are used. One is a built-in air pressure regulator. The second is a needle type valve which controls the oil flow.

Air Dried Automatically—In operation of the lubricator, dry clean air must be used. Alemite has provided a new water separator, self-emptying, without interruption while in use, to assure dry, clean air for the system. This separator removes 98 to 99 per cent of moisture from the air, company engineers assert.

Operation of the lubricator, Fig. 1, heart of the system, is as follows: Oil is poured through the inlet 1 into the reservoir 2. Hose line air supply is connected to point 3 or 4, whichever is more convenient. Air flows through air regulator 5 where it is reduced to the desired operating pressure, which is recorded on air gauge 6. Low pressure air now

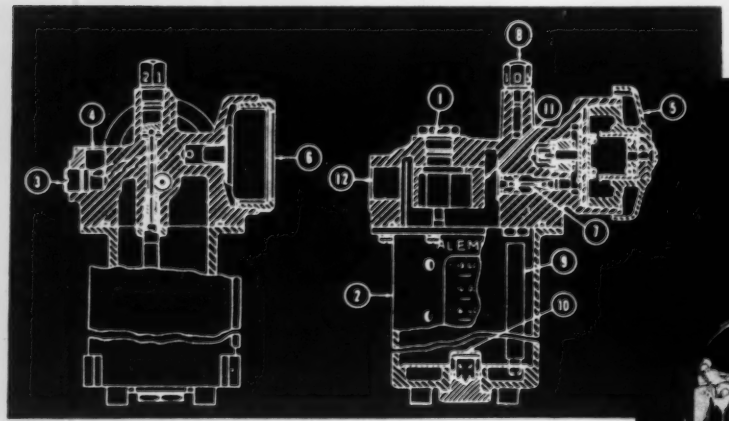

Fig. 1 (above)—Cross-sectional views of the lubricator, the heart of the oil-mist system

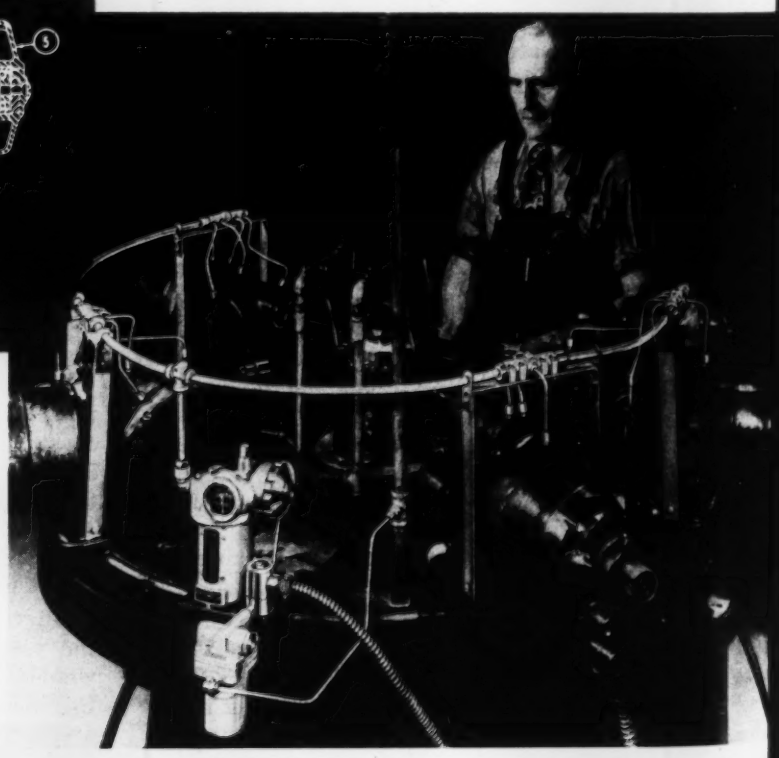

Fig. 2 (right)—This multiple-head Kingsbury drilling machine is equipped with the oil-mist system of lubrication. Note the main line from which branch lines are directed to the individual lubrication points

flows through the passage 7, through the lubricator and out into the supply line 12.

When the oil flow regulator 8 is opened, the oil is drawn up the venturi tube 9, and in so doing, is passed through the strainer 10.

The oil which is drawn up the venturi tube 9 mixes with the air in the passage 7. This mixture blasts against a baffle 11 which collects the large droplets of oil and returns them to the oil reservoir 2, leaving only an atmosphere filled with microscopic oil mist particles of approximately 20 microns. Baffle also is used to adjust the lubricator for a dry or wet mixture. The wetter the mixture, the larger the droplets. The oil mist then passes into the main supply line through outlet 12.

Lubricates 20 Points—In one machine tool application, an automatic drilling machine, one unit lubricates 20 points, including cam, quill, worm and gear, reduction gear, gear and rack, gear train, plain and ball bearings. In a test extending over several months the machine used but one ounce of oil for each eight hours of operation, drawing less than one cubic foot of air per minute at 10 psi.

Oil-mist installations in industrial plants to date have been limited to tests and tryouts both in Stewart-Warner plants and others during the course of engineering development and field test work. None has been sold. Shipments starting soon will be of actual production units.

Plug Welding Shortcuts Jacketed Vessel Production

Pressure jackets are fastened to the inside liners of stainless process vats by a fast semiautomatic welding method

MAINTAINING sterile conditions within pressure vessels used to heat and cool fluids is a major problem in the chemical, food and dairy industries. Jacketed type construction of the vessel is one answer to the problem.

The Pfaudler Co., Rochester, N. Y., uses a new plug welding fastening method to join the pressure jacket to the inside liner on their 100 to 1000-gallon 100-psi pressure process vats. Stainless steel construction throughout and the no-coil feature makes it easy to keep the interior of the vessel clean.

Three-in-One Design — The vat itself consists of three stainless steel cylinders. The inner liner is 12-gage polished stainless steel. The second, a 12-gage stainless dimpled jacket is securely plug welded to the inner one. The heating or cooling fluid passes between these two liners. Compressed glass fiber insulation 2 inches thick is fastened around the dimpled jacket; an outside polished stainless steel sheathing completes the construction. A slowly rotating agitator and a fixed baffle assure even heating or cooling of the material within the vat.

Special ⅜ x 1-inch grooved stainless steel studs are used here to plug weld the dimpled outer shell to the inner shell of this pressure process vat. Speed of the plug welding process prevents "burn through" into the vat. This eliminates 90 per cent of the hand finish grinding

No Distortion, No Grinding—Joining the two inner liners to each other posed an unusual production problem. The second liner is fastened securely to the outer surface of the inner shell without roughening the inner surface. Previous method of hand plug welding the dimpled second liner to the inner shell resulted in excessive distortion of the inner surface.

To maintain a smooth surface and eliminate the expensive hand grinding formerly required, it was decided to use the Nelson semiautomatic plug welding method. Appearance of the finished product is vastly improved, production times and costs reduced.

Inner tank sheets are rolled to conform to the desired diameter of the tank and seam welded, then mounted on large steel expansion mandrels.

Dimples Do It—Preparation of the dimpled jacket requires considerable care. The dimples must be consistent in height and flat across the bottom. They are staggered in rows about 4 inches apart and formed in a press brake to form one complete row of dimples the width of the sheet. The desired heating or cooling properties of the finished vat determine the depth and spacing of the dimples.

The dimpled jacket is clamped securely to the inner tank by means of compression bands. These are drawn up tight to be sure all the dimples make good contact with the inner liner.

Next step in the fastening procedure is to plug weld the two shells together at each dimple. This is done by using a hand-operated stud welding gun and special grooved studs. After completing this operation the perimeter of the dimpled jacket is hand arc welded to the inner shell.

Welder Has the Upper Hand—Plug welding is always done in the downhand position. The operator first inserts the grooved stud and ferrule in the chuck of the gun. The stud is then positioned in the dimple, and the gun's trigger pulled. In a fraction of a second, the weld is completed and the portion of the stud remaining in the gun is ejected.

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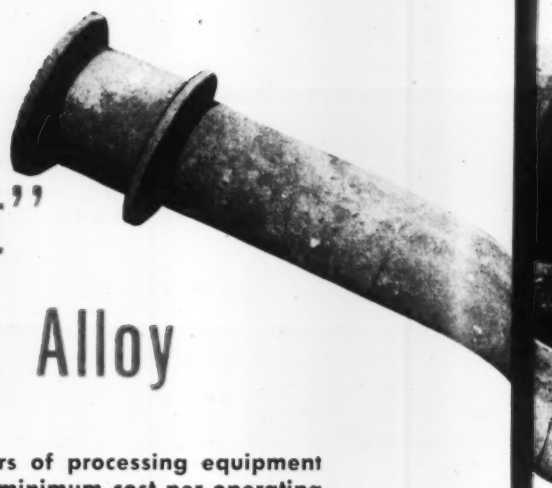


How To Select the "Right" Cast Heat Resistant Alloy

Problem constantly facing manufacturers and users of processing equipment operating at high temperatures is: How to realize minimum cost per operating hour from cast heat resistant alloys. Choosing the right material goes a long way in alleviating the problem. Today's metal shortages do not yet mean less efficient operations, nor do the more costly types of alloys provide most economical service

By N. A. MATTHEWS
Division Metallurgist, Electro-Alloys Div.
American Brake Shoe Co.
Elyria, O.

HOW TO realize minimum cost per operating hour from cast heat resistant alloys is a problem constantly facing manufacturers and users of industrial processing equipment operated at temperatures from 1200 to 2100°F. From the wide selection of materials available, there are many "right" and "wrong" choices to make, especially in these days of strategic material shortages.

Proper choice of an alloy to do a given job depends upon several considerations. Among these are hot gas corrosion resistance, hot strength, hot ductility, cold ductility, carburization resistance, thermal fatigue resistance, foundry handling, machinability and weldability properties of the material.

The standard grades of conventional chromium-iron, chromium-nickel-iron and nickel-chromium-iron alloys are listed in Table I which gives the Alloy Casting Institute designations. These are also covered by ASTM tentative specification A297-49T. These grades were not originally intended as specification values. In the case of some grades the ranges are too broad to result in the uniformity of properties desired for critical applications.

Choose Wisely and Save Money—Such alloys are subject to much closer production control than was the case 10 years ago. As a result, it is no longer true that the more costly alloys necessarily will provide the most economical service.

Available data on the physical constants for these alloys are shown in Table II. This compilation was made by a special committee of the Iron & Steel Division, Society of Automotive Engineers.

Room temperature mechanical properties are shown in Table IV, covering as-cast and aged conditions. These data do not reflect the extreme chemical ranges shown in Table I but instead correspond to a commercial range involving 0.10 per cent carbon in the case of chromium-predominating alloys and 0.15 per cent for the nickel-predominating alloys and somewhat narrower chromium, nickel and silicon ranges.

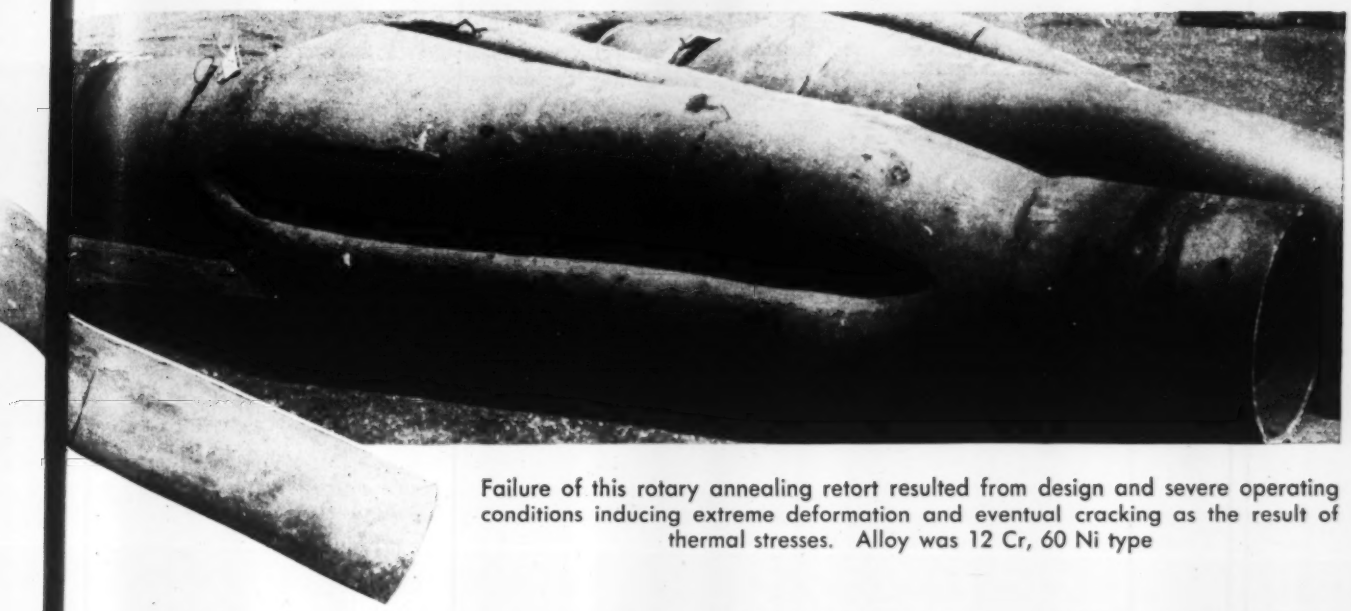
Elevated temperature properties are presented in Table III for those temperatures for which individual alloys are normally considered applicable. These data are based on relatively narrow carbon ranges corresponding to plus or minus 0.05 per cent and plus or minus 0.08 per cent carbon for the chromium and nickel-predominating alloys respectively from the approximate midpoints of the carbon ranges detailed in Table I. Ranges of other elements involved are materially less.

Those partially ferritic grades such as HE and HH develop widely different hot strength values depending upon individual heat analyses. In the cases of these grades, the values are typical of those heats representing the low side of the hot strength expectancy.

Creep Rates Increased—Design stress is usually based upon the limiting creep stress (LCS) value which may be sustained without exceeding a rate of extension correspoding to 0.0001 per cent per hour or 1 per cent in 10,000 hours. A figure of 50 per cent of the limiting creep stress is satisfactory for most noncyclic temperature applications. If the part

Alloy Type	1200 100* HR	1200 1000† HR	1200 LCS‡ psi	1300§ 100	1300§ 1000	1300§ LCS	1400 100	1400 1000	1400 LCS
HC	....	....	....	....	....	....	3300	2300	1300
HE	....	....	....	....	....	....	11000	....	3100
HF	24000	17000	13000	17000	12000	9000	12000	8000	6200
HH(1)	....	....	....	....	....	....	14000	....	5000
(2)	....	....	....	....	....	....	13000	9200	6000
HK	....	....	....	....	....	....	....	....	....
HT	....	....	....	....	....	....	17000	12000	7700
HU	....	....	....	....	....	....	14000	....	8400
HW	....	....	....	....	....	....	10000	7700	6000
HX	....	....	....	....	....	....	12000	7200	6100

HH(1)—partially ferritic; HH(2)—stably austenitic.
* 100 hr stress rupture value; † 1000 hr stress rupture value;



Failure of this rotary annealing retort resulted from design and severe operating conditions inducing extreme deformation and eventual cracking as the result of thermal stresses. Alloy was 12 Cr, 60 Ni type

Cement kiln feed pipe failure. Alloy was type HH (26 Cr, 12 Ni), partially ferritic. This was an improper alloy for 1500° F temperature. Failure resulted from thermal stresses applied to an alloy which embrittles at 1500° F

TABLE I
STANDARD GRADES OF CAST HEAT RESISTANT ALLOYS

ACI Type	Composition—per cent C	Mn max.	Si max.	P max.	S max.	Cr	Ni	Other Elements max.*
HC	0.50 max.	1.00	2.00	0.04	0.04	26–30	4 Max.	Mo 0.5
HD	0.50 max.	1.50	2.00	0.04	0.04	26–30	4–7	Mo 0.5
HE	0.20–0.50	2.00	2.00	0.04	0.04	26–30	8–11	Mo 0.5
HF	0.20–0.40	2.00	2.00	0.04	0.04	18–23	8–12	Mo 0.5
HH	0.20–0.50	2.00	2.00	0.04	0.04	24–28	11–14	Mo 0.5 N 0.2
HI	0.20–0.50	2.00	2.00	0.04	0.04	26–30	14–18	Mo 0.5
HK	0.20–0.60	2.00	3.00	0.04	0.04	24–28	18–22	Mo 0.5
HL	0.20–0.60	2.00	3.00	0.04	0.04	28–32	18–22	Mo 0.5
HT	0.35–0.75	2.00	2.50	0.04	0.04	13–17	33–37	Mo 0.5
HU	0.35–0.75	2.00	2.50	0.04	0.04	17–21	37–41	Mo 0.5
HW	0.35–0.75	2.00	2.50	0.04	0.04	10–14	58–62	Mo 0.5
HX	0.35–0.75	2.00	2.50	0.04	0.04	15–19	64–68	Mo 0.5

* Molybdenum not intentionally added.

TABLE II
PHYSICAL CONSTANTS—HEAT RESISTANT ALLOYS

ACI Type Alloy	HC	HD	HE	HF	HH	HK	HL	HT	HU	HW	HX
Modulus of elasticity in tension, room temp, psi x 10^6	29	29	22	28	28	29	29	24	24	25	25
Density, lb per cu in.	0.274	0.274	0.276	0.280	0.279	0.280	0.279	0.286	0.290	0.294	0.295
Melting point, approximate, deg Fahr	2725	2700	2650	2575	2500	2550	2600	2425	2425	2350	2350
Specific heat, Btu/lb/deg Fahr @ 70°	0.12	0.12	0.14	0.12	0.12	0.12	0.12	0.11	0.11	0.11	0.11
@ 1500°	....	....	....	....	....	....	....	0.135	....	0.126	0.126
Thermal conductivity, Btu/hr/sq ft/ft/deg Fahr 70–212°	12.6	12.6	....	9.0	8.2	8.2	....	7.7	....	7.7	....
70–1000°	17.9	17.9	....	13.4	10.9	10.9	....	11.4	....	....	....
70–1500°	20.3	20.3	....	15.0	14.3	11.9	....	....	....	....	....
70–2000°	24.2	24.2	....	16.9	16.4	....	....	....	....	....	....
Mean coefficient of linear thermal expansion per deg Fahr. x 10^6 70–1000°	6.3	7.7	....	9.9	9.6	9.2	....	8.9	8.9	7.9	7.5
70–1500°	6.8	8.5	10.0	10.3	10.0	9.7	....	9.2	9.1	8.5	8.0
70–2000°	7.7	9.2	....	10.9	10.8	10.6	....	9.8	9.7	9.2	8.7
Specific electrical resistivity, microhms/cm/cm² @ 70° F	77	81	85	80	75–85	90	94	100	106	108	112
Magnetic Permeability	*	See	*1.34	* 1.0–1.06	range	*1.01	*1.005	*5.64	*2.77	*16.8	*2.0
	†14.7	HC	†1.30	†1.01–1.05	1.003–	†1.01	†	†8.59	†1.36	†16.9	†1.2
	‡ 9.9	....	‡1.78	‡1.01–1.02	1.100	‡1.015	‡1.01	‡1.51	‡1.16	‡16.6	‡1.1

* As cast
† After 48 hrs at 1600° F
‡ After heating at 2100° F 2 hrs, then water quenched

TABLE III
ELEVATED TEMPERATURE STRENGTH PROPERTIES

Temperature—°F 1500			1600			1700			1800			1900			2000			2100			Alloy Type
100	1000	LCS	100	1000	LCS	100	1000	LCS	100	1000	LCS	100	1000	LCS	100	1000	LCS	100	1000	LCS	
2400	1600	1000	1700	1250	740	1200	860	530	820	620	360	....	....	....	....	....	....	....	....	....	HC
7500	....	2200	5200	....	1600	3500	....	1150	2400	....	800	....	....	....	....	....	....	....	....	....	HE
8400	5500	4300	6000	3800	3000	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	HF
9600	....	3800	6800	....	2900	4600	....	2100	3300	....	1500	2200	....	900	1500	....	450	....	....	....	HH(1)
9000	6800	4600	6500	4800	3500	4800	3500	2700	3500	2500	2000	2600	1700	1200	1800	1100	750	....	....	....	(2)
11000	....	5900	8400	....	4700	6500	....	3600	4900	....	2700	3700	....	1900	2750	....	1100	....	....	500	HK
12000	9500	6000	9000	7000	4500	6500	5200	3200	4800	3750	2000	3500	2700	1200	2500	1700	500	....	....	....	HT
11000	....	6200	7800	....	4500	5500	....	3200	3900	....	2000	2600	....	1300	1600	....	600	....	....	....	HU
7700	6000	4600	5900	4500	3600	4500	3500	2700	3300	2600	2000	....	....	....	....	....	....	....	....	....	HW
8500	5500	4500	6500	4200	3400	4800	3200	2500	3400	2300	1900	2500	1600	1300	1700	....	500	....	....	....	HX

† Limiting Creep Stress for minimum rate of 0.0001% per hour or 1% in 10,000 hours;
‡ values for 1300, 1500, 1700 and 1900° F are interpolations from essentially straight-line plots.

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Function of Individual Elements

Chromium. Very important and essentially only property imparted by chromium is oxidation resistance. It exerts a minor beneficial effect upon hot strength.

Nickel. This element is essential to a high degree of hot strength since austenitic phase is required. It also fortifies chromium in its role. It imparts carburization resistance and resistance to thermal fatigue.

Carbon. Carbon is an austenite-forming element, exerts pronounced effect on hot strength. It is the main reason why cast alloys are generally superior in hot strength.

Silicon. Silicon assists in oxidation and carburization resistance. In some grades it promotes a strengthening effect at elevated temperatures up to a critical value beyond which hot strength and ductility decline.

Nitrogen. Nitrogen is of importance only in those grades where it may be employed advantageously to promote austenite. In straight chromium grades it assists in grain refinement resulting in improved ductility.

Manganese. This element in minor quantities does not have an observed effect on properties.

Molybdenum. Molybdenum benefits oxidation resistance to a limited extent and improves hot strength.

Columbium. This element has a potent beneficial effect on hot strength in some grades and a milder effect in others. It promotes resistance to cracking in thermal fatigue service. Interrelated effects among the several elements are important considerations in only the most critical applications.

is loaded repeatedly for a short time during each cycle, the 100 or 1000-hour stress rupture values provide additional data permitting a refinement in design.

Thermal cycling increases creep rates greatly in the case of the 16 per cent Cr 35 per cent Ni (HT) type alloy. Similar effects have been observed for the HH, HK and HU types of alloys. At 1800°F a ten-fold effect is average, whereas at 1600°F, a five-fold weakening is observed. At 1400°F, the effect is negligible. At 2000°F the effect is even more pronounced than at 1800°F as may be expected from the partial solubility of carbide and subsequent agglomeration mechanism observed.

The ferritic alloy (HC—27Cr, 2Ni) is relatively weak. It has exceptionally good ductility above 1200°F but embrittles in service at temperatures in the range 1200 to 1650°F. The nickel-predominating alloys HT, HU, HW and HX have maximum strength up to approximately 1600°F; above this temperature the higher hot strength chromium-predominating alloys such as HK become increasingly superior as the temperature increases. Properties of the HF (20 Cr, 10 Ni) grade are currently getting special attention.

Higher Nickel-Better Hot Ductility—Hot ductility of the several grades is hard to compare. Normally, the stresses leading to cracking occur before operating temperatures are reached or during rapid cooling; in addition, the ductility of real importance is that remaining after hundreds of hours of service. Such data are not available to date.

Table V provides data obtained from stress rupture tests of from 50 to 200 hours duration, representing total elongation at fracture. These data indicate that the higher nickel alloys are superior in hot ductility after relatively short time exposure. However, there are innumerable cases where less alloyed materials will perform equivalently on a cost per operating hour basis. In these days of a nickel shortage, the leaner alloys might be tried.

Hot Gas Corrosion Resistance—Surface stability is essential in all heat resistant alloy applications. Tolerable corrosion rates vary necessarily with expected life as controlled by other variables but stability involves corrosion rates of less than 0.05-inch per year except for some long-term installations (10-year design life of oil refinery tube supports) where values in excess of 0.005-inch per year are not desirable.

Commercial atmospheres vary widely but fall into the three categories: (a) Air, (b) oxidizing fuel combustion products and (c) reducing flue gas combustion products. In the case of atmospheres resulting from fuel combustion, an additional variable involves sulphur content. Sulphur is detrimental to alloys relatively low in chromium, especially when it occurs in a reducing atmosphere which causes conversion of the contained nickel and iron to sulphides.

Maximum operating temperatures for the individual grades are given in Table VI as a function of the several type atmospheres and on the basis of corrosion rates less than 0.05-inch per year. These levels are confirmed by field experience. Limited data available on sulphur levels corresponding to coke oven gas suggest that the additional sulphur alters the picture adversely only in the case of those grades containing 35 per cent or more of nickel with correspondingly low chromium contents.

Resistance to liquid baths is a common problem. Cyanide and lead baths are satisfactorily handled by the higher nickel grades such as HK, HT, HU and HW. Special modifications of the 16 per cent Cr 35 per cent Ni types have been developed for neutral salt service. Nickel must be avoided in alloy pots for magnesium melting service. Alloys with 18 to 24 per cent chromium offer promise of effecting real economies. There is no known nickel-chromium-iron combination that will satisfactorily resist molten aluminum-base or copper-base alloys.

TABLE IV
ROOM TEMPERATURE MECHANICAL PROPERTIES

Alloy Type	Condition	Y.S.; psi 0.2% offset	T.S., psi	% El. in 2"	% R.A.	Brinell Hardness
HC	As-cast	45–50000	65–90000	0.5–5	0.5–5	180–240
	Aged‡	48–58000	67–92000	Nil–4	Nil–4	190–240
HE	As-cast	42–76000	95–107000	4.5–18	2.7–17	207–269
	Aged	60–70000	79–88000	Nil–4.5	Nil–6.2	226–387
HF	As-cast	40–50000	73–93000	32–43	25–39	160–180
	Aged	50–57000	97–110000	18–35	19–34	175–210
HH*	As-cast	35–60000	72–95000	13–35	15–38	160–215
†		32–50000	83–98000	18–45	20–45	160–180
*	Aged	37–65000	75–100000	4–32	4–32	190–230
†		30–48000	85–105000	9–35	8–35	175–220
HK	As-cast	40-72000	72–84000	14–24	15–31	155–180
	Aged	40–74000	76–95000	6–18	6–22	175–210
HT	As-cast	38–52000	60–72000	4–20	6–21	156–200
	Aged	50–67000	84–92000	3–10	4–18	200–215
HU	As-cast	29–40000	67–72000	4–16	3–17	160–200
	Aged	40–45000	73–80000	3–9	4–17	200–215
HW	As-cast	30–37000	59–73000	3–9	4–9	166–200
	Aged	49–61000	80–88000	3–9	4–11	196–220
HX	As-cast	34–39000	70–80000	6–10	7–12	190–210
	Aged	43–48000	82–95000	5–10	5–12	200–220

* Partially ferritic type; † stably austenitic type.
‡ Aging treatment 1400° F—24 hours—furnace cool.

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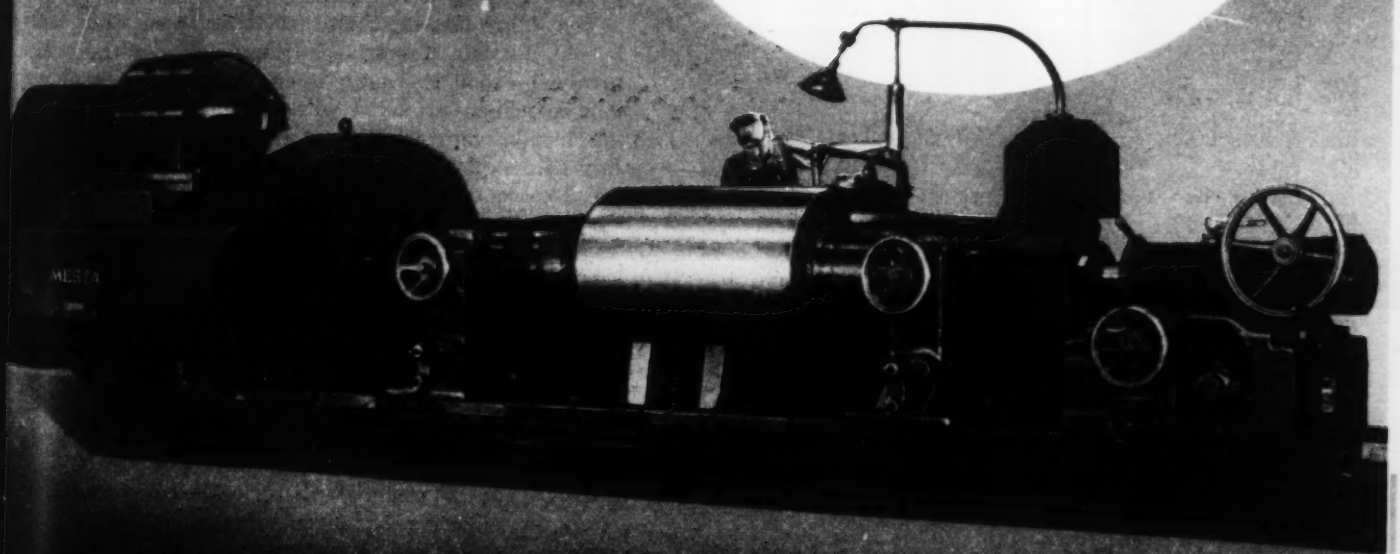

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Resistance to Carburization Vital—Carburization resistance is important where carburizing atmospheres are involved. A major percentage of the alloy castings utilized by the automotive, aircraft, farm implement and allied industries are exposed to carburizing conditions. All heat-resistant alloys carburize but the rate varies greatly and is influenced by carbon, silicon and nickel. Higher nickel grades are standard for this type of service because: Nickel retards the carburization rate; even when carburized, higher nickel grades retain sufficient ductility to resist cracking from thermal cycling.

TABLE V

DUCTILITY VALUE (% Elongation in 2") FROM STRESS RUPTURE TESTS OF 50–200 HOURS DURATION

Alloy	1400° F	1600° F	1800° F	2000° F
	Elongation at fracture—%			
HC	70	90	140	
HE	10–25	15–30	15–30	
HF	5–12	6–13		
HH(1)	8–15	6–20	5–25	
(2)	3–10	3–10	4–12	
HK	5–10	5–20	5–20	4–20
HT	6–20	3–15	6–12	
HU	10–20	6–15	6–18	
HW	15–25	8–20	10–20	
HX	15–25	8–20	10–20	15–25

Variability constituting ranges mainly attributable to variable hours life; in the same alloy elongation decreases with stress level and resultant increasing fracture time.

TABLE VI

MAXIMUM OPERATING TEMPERATURES (°F) FOR SURFACE STABILITY

(From data obtained by Alloy Casting Institute Program at Battelle Memorial Institute)

Alloy	Air	FLUE GASES Oxidizing †Low Sulphur	Oxidizing ‡High Sulphur	Reducing †Low Sulphur	Reducing ‡High Sulphur
HC	2000	2000	2000	2050	2000
HD	2050	2050	2050	2100	2050
HE	2150	2150	2100	2150	2050
HF	1700	1700	1700	1800	1700
HH(1)	2050	2050	2000	2050	1900
HH(2)	1950	1950	1850	1950	1800
HK	2150	2150	2050	2150	1900
HT	1950	1950	1800	1950	1750
HU	2050	2050	1950	2000	1800
HW	1950	1950	1700	1950	1600
HX	2150	2150	1900	2150	1850

HH(1)—partially ferritic; HH(2) stably austenitic type.

† Corresponding to natural gas firing or 5 grains S per 100 cu ft; ‡ corresponding to high sulphur oil firing or relatively low sulphur bituminous coal firing or 100 grains S per 100 cu ft.

TABLE VII

CARBURIZING RESISTANCE

Test A:* Carbo-Nitriding Atmosphere at 1650° F—1680 hours.

Type	C%	Si%	Ni%	Cr%	Analysis of Sub-surface Layers Carbon Per cent 0.000–0.015"	0.015–0.030"	0.045–0.060"
HW	0.31	0.74	57.9	12.1	1.36	1.31	1.13
HW	0.45	1.53	60.6	13.4	0.56	0.57	0.48
HX	0.57	2.13	64.2	14.8	0.69	0.78	0.66
HT	0.57	2.13	34.9	16.0	0.74	0.76	0.64
HK	0.32	1.25	20.0	26.3	0.44	0.40	0.36
HK	0.31	2.12	20.1	26.6	0.35	0.31	0.30

Test B:* Carbo-Nitriding Atmosphere at 1650° F—1200 hours.

HW	0.31	0.74	57.9	12.1	...	1.31	0.77
HW	0.45	1.53	60.6	13.4	0.50	0.49	0.44
HX	0.57	2.13	64.2	14.8	0.56	0.60	...
HT	0.44	1.29	36.3	15.7	0.62	0.63	0.52
HT	0.56	1.27	34.8	15.9	1.85	1.94	1.11
HT	0.57	2.13	34.9	16.0	0.89	...	0.72
HK	0.32	1.25	20.0	26.3	0.42	0.38	0.30
HK	0.31	2.12	20.1	26.6	0.30	0.37	0.32
HK	0.30	2.51	19.8	26.5	0.37	0.34	0.29
Wrought Inconel	0.09	0.19	76.6	14.6	1.02	0.38	0.34
Cast Inconel	0.25	1.31	79.1	18.1	0.27	0.24	0.26

* 30% Ammonia; balance made up of 18–20% CO; 48–52% H_2; 6% CH_4, 0–0.2% CO_2.

Test C:† Carbo-Nitriding Atmosphere at 1530° F—2500 hours

Type	C%	Si%	Ni%	Cr%	Analysis of Sub-surface Layers Carbon Per cent 0.000 0.015"	0.015 0.030"	0.030 0.045"	0.045 0.060"	0.060 0.075"	0.075 0.090"
HX	0.57	2.13	64.2	14.8	0.58	0.58	0.55	0.55	0.57	0.54
HW	0.46	2.04	59.6	12.2	0.53	0.45	0.45	0.45	0.46	0.45
HT	0.44	1.29	36.3	15.7	0.68	0.49	0.46	0.46	0.47	0.46
HT	0.42	1.85	34.6	16.1	0.54	0.43	0.41	0.42	0.40	0.41
HU	0.46	2.03	38.0	18.0	0.49	0.46	0.47	0.46	0.46	0.46
Wrought Inconel	0.09	0.19	76.6	14.6	0.45	0.16	0.10	0.08	0.09	0.07
Cast Inconel	0.25	1.31	79.1	18.1	0.25	0.22	0.22	0.22	0.23	0.23

† Atmosphere used per hour involves 55 cu ft. Natural Gas; 350 Cubic Feet Carrier Gas; 190 Cubic Feet Ammonia.

Ten years ago, 12 per cent Cr 60 per cent Ni alloy was standard for carburizing service. Now it is displaced by 16 per cent Cr 35 per cent Ni and 18 per cent Cr 38 per cent Ni types. In some major retort operations, the 25 per cent Cr 12 per cent Ni type, carefully adjusted and controlled, demonstrated its ability to compete on a cost-per-operating-hour basis. Data in Table VII were derived from three field test exposures to carbo-nitriding (or dry cyaniding) atmospheres. These results are given because they are based upon long periods of time, and the atmospheres represent some of the most severe carburizing environments encountered in modern heat treating operations.

Silicon and Carbon Control Important—Tests A and B indicate clearly the importance of silicon and carbon control as applied to the 12 per cent Cr 60 per cent Ni type alloy. With moderately low carbon and low silicon, this grade carburized as rapidly as any of those involved. Notice in test B that one heat of the 16 per cent Cr 35 per cent Ni type carburized rapidly whereas the other two heats appeared favorable. For conventional carburizing service, the 16 per cent Cr 35 per cent Ni type, properly controlled, is usually the logical choice based upon a cost-per-operating-hour basis.

Special alloys may be necessary for carbonitriding service depending upon temperature. Utility of lower nickel grades is also indicated but their use should be approached with the precaution of a suitable field test.

Thermal Fatigue a Stress Problem—The problem of thermal fatigue is paramount in trays and fixtures for carburizing and hardening operations by which the alloy parts are quenched (usually in oil) following each cycle at temperature. Basically it is a stress problem, with the stress primarily the result of thermal gradients. Failure is by surface checking induced by the repeated plastic deformation of the surface fibers which perhaps are partially embrittled by carburization.

The Alloy Casting Institute is studying this problem at Battelle Memorial Institute. Under the cycles involved (1600°F—water quench) and with a simple disk specimen provided with stress raisers, interesting trends were established which substantially confirm field experience.

A. HW (12Cr 60Ni) and HX (15Cr 65Ni)—These alloys are outstanding; field tests confirm.

B. HU (18Cr 38Ni)—Not tested; field experience suggests excellent behavior on a unit cost basis if analysis is properly controlled.

C. HT (15Cr 35Ni)—Poor as-cast but greatly improved by conditioning heat treatment. Confirms erratic behavior of alloy as normally utilized with no pretreatment. After conditioning heat treatment performance is outstanding. Field test confirmation being obtained.

D. HK (26Cr 20Ni)—Behavior erratic; with carbon content fairly low (0.25 to 0.30%) performance is good as-cast and with prior thermal treatment is improved greatly at higher carbon levels.

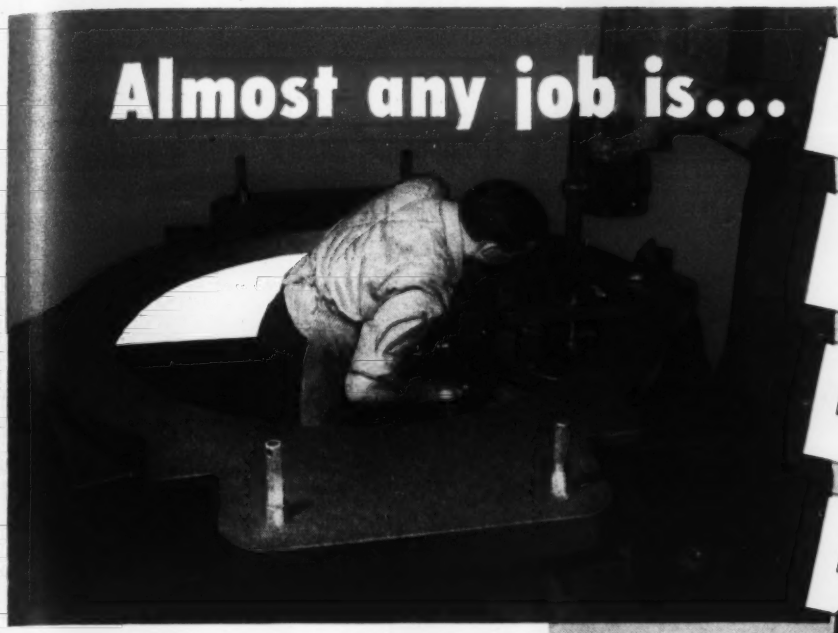
E. HH (26Cr 12Ni). Partially ferritic heats are poor. The austenitic variety is fairly good if carbon level is proper and is greatly improved by thermal pretreatment. Data suggest utility of alloy for noncarburizing applications.

F. HE (29Cr 9Ni). HD (27Cr 6Ni) and HC (27Cr 2Ni). Alloys not tested and not recommended.

This complex problem is far from being resolved. Many complicating factors are involved. Some of the recent modified alloys suggest that great improvements through analysis variations or thermal pretreatments are possible and the user should not be content with existing performance or heat-hour cost figures.

(*Please turn to Page* 104)

Almost any job is...



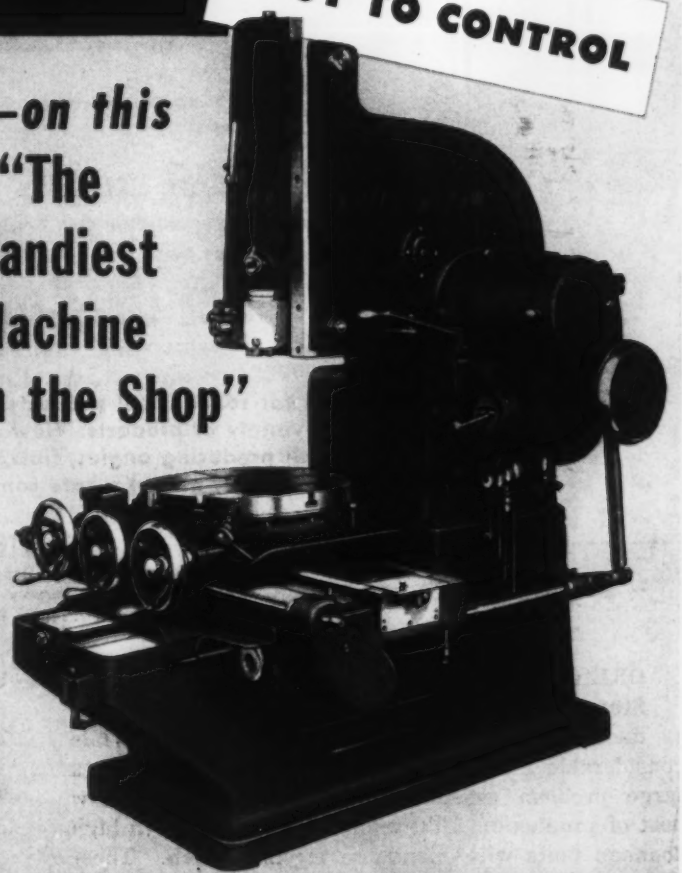
EASY TO MOUNT

EASY TO INDEX

EASY TO OBSERVE

EASY TO CONTROL

—*on this* "The Handiest Machine in the Shop"



Use it in the toolroom for any kind of fixture, jig or tool work. Vertical design makes it easier for cutting tool to get at hard-to-reach surfaces and machine intricate shapes, odd bosses and slots. Built-in rotary table gives accurate indexing.

Use it in the die shop to machine any shape *to a line*. Ram adjusts to angular setting for machining relief angles directly.

They call it "the handiest machine in the shop" because of its adaptability, general usefulness, and maximum productivity.

Bulletin lists all advantages; send for your copy.

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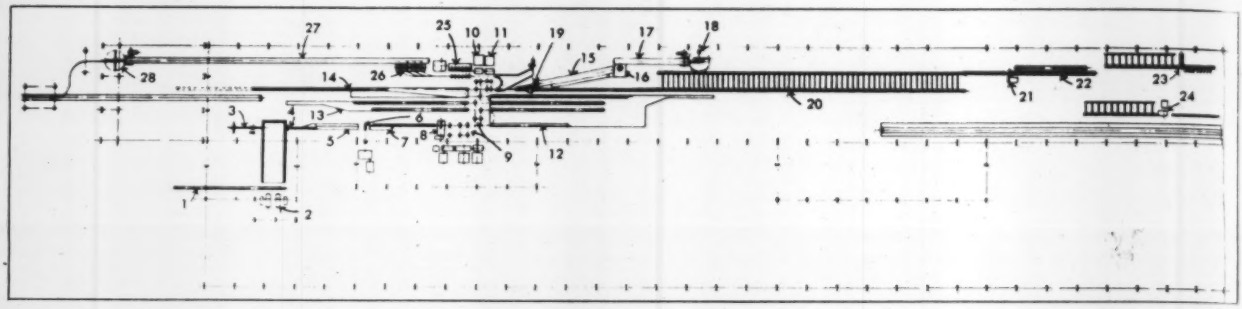


Fig. 1—Layout of 18, 14, 12 and 10-inch combination rod, merchant, structural and narrow strip mills

1. Furnace charging table
2. Furnace pusher
3. Furnace billet ejector
4. Pinch rolls
5. 18" approach table & transfer
6. 18" 3-h 2-speed mill
7. Split tilting table & automatic transfer
8. Vertical edger
9. 5-stand 14" mill
10. 2-stand 12" mill
11. 2-stand 10" mill with repeater
12. Runout tables, transfers, repeaters, etc.
13. Same
14. Skew table
15. Strip vibrator and conveyor
16. Strip coiler
17. Strip coil conveyor
18. Coil bundle holder
19. Flying shear
20. Notch & flat bar cooling bed
21. Cold shear
22. Table, gage, cradles, scale
23. Cold saw, skids, tables, gage and cradles
24. Straightener with loading skids and tables
25. 6-st 10" cont. rod mill
26. Rod coilers
27. Coil conveyors & unloader
28. Coil bundle handle

Standard Belgian Mill Adapted for South American Use

Limited demand for rolled steel products in Chile necessitates use of a mill that produces a variety of products. New Concepcion mill is virtually a "jack-of-all-trades" unit producing angles, flats, narrow strip, skelp and rods with a minimum of hand labor, and at a rate commensurate with the country's needs

By E. C. PETERSON
Engineering Department
Birdsboro Steel Foundry & Machine Co.
Birdsboro, Pa.

FOREIGN representatives are coming to the United States to learn the methods by which steel is produced in such quantity and at such low cost. While considerable information has been made available, a large problem remained unsolved. To obtain low cost of production, American mills have gone to high tonnage units with maximum mechanization. These mills require large tonnage orders to operate economically, and each has been adaptable to a single class of product. With a consuming market of 130,000,000 people, such units have found wide application. But most foreign markets consume only a small fraction of the quantities of rolled steel products used in this country, and high-tonnage specialty mills, always costly to install, would operate only a few months a year to satisfy the demand for their products.

Installs Finishing Mills—A relatively small South American country has undertaken, since the war, to construct an integrated steel plant known as Acero del Pacifico, near Concepcion, Chile. In order to solve the problem just mentioned, a finishing mill has been developed and manufactured for them by the Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa., in conjunction with H. A. Brassert & Co., New York, and Koppers Co., Pittsburgh, as consultants. The plant is capable of relatively high tonnage production, with a minimum of hand labor, and a variety of product that would normally be produced on three specialty mills. A diagrammatic layout of this mill is shown in Fig. 1.

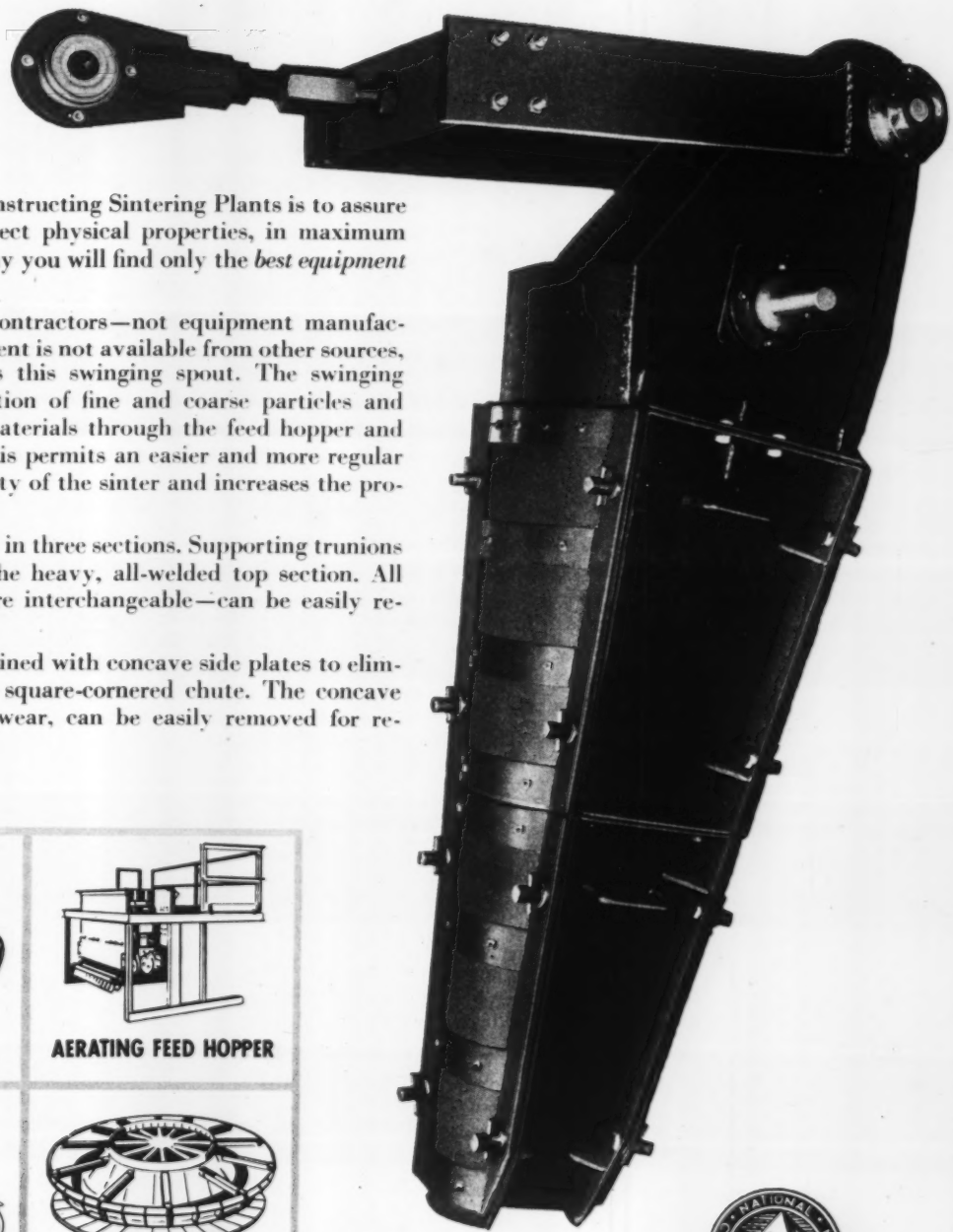
A general view of the mill is shown in Fig. 2. In the upper right hand corner are shown the 14-inch continuous stands. In the center are the 14 and 12-inch cross-country mills with tables and automatic transfers and a skew table. Repeaters are used for rolling both rods and flats, and the flat repeaters are shown in place. The cooling bed is shown in the upper left corner, and to its left the skelp coiling and handling equipment. In the left center is the 6-stand continuous rod mill and in the left foreground are the four rod coilers arranged for automatic operation and discharging on a conveyor at the left.

Adopts Belgian Type Mill—The first development

This Swinging Spout, a special feature of

McKEE SINTERING PLANTS,

improves the quality and increases the production of Sinter



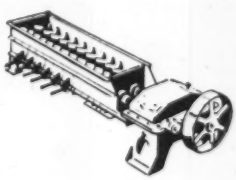
OUR objective in designing and constructing Sintering Plants is to assure the production of sinter of correct physical properties, in maximum quantity and at lowest cost. That's why you will find only the *best equipment available* in McKee-built plants.

We are primarily engineers and contractors—not equipment manufacturers—but, when satisfactory equipment is not available from other sources, we design special equipment such as this swinging spout. The swinging action of this spout controls segregation of fine and coarse particles and results in a uniform distribution of materials through the feed hopper and onto the sintering machine pallets. This permits an easier and more regular flow of gases which improves the quality of the sinter and increases the productive capacity of the machine.

The McKee swinging spout is made in three sections. Supporting trunions and drive trunions are mounted on the heavy, all-welded top section. All supporting and oscillating bearings are interchangeable—can be easily replaced from a single stock size.

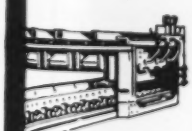
The two lower sections are rubber-lined with concave side plates to eliminate building up of material as in a square-cornered chute. The concave side sections, which receive greatest wear, can be easily removed for replacement or repair.

…her exclusive …Kee equipment …eloped to meet …inite needs in …tering Plants:

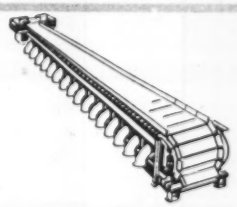


PUG MILLS

AERATING FEED HOPPER



…NITION FURNACE



SINTERING MACHINE

ROTARY AIR COOLER

NATIONAL CONSTRUCTORS ASSOCIATION — OIL STEEL CHEMICAL

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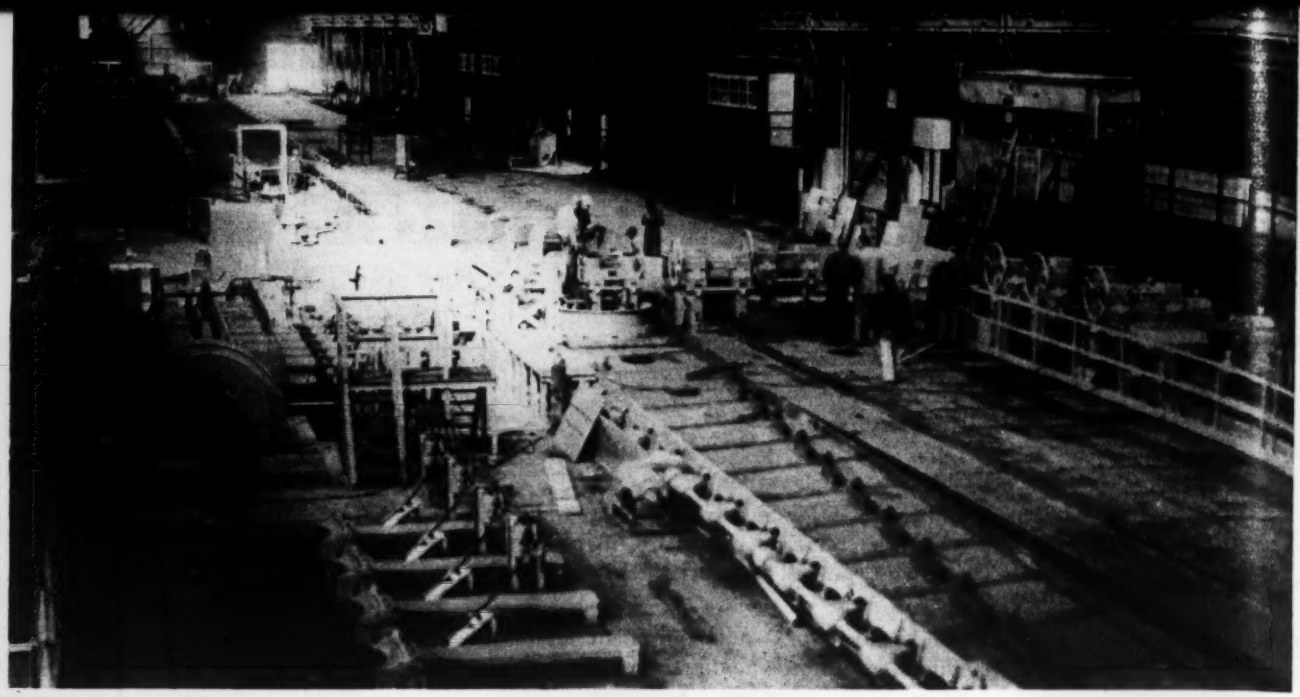

Fig. 2—General view of the mills looking toward the finishing end

in bar mills beyond the simple in-line mills, was the so-called Belgian mill, usually with a 16 or 18-inch three-high roughing mill, and a four or five stand 12-inch three-high finishing mill. Through all the years of mill development, this arrangement has remained the most adaptable to production of a wide variety of products. Arrangement of the presently-described mill has been made around the standard Belgian mill including an 18-inch rougher, three 14 and two 12-inch stands.

It is usual, on the Belgian mill rougher, to take five or seven passes. By reducing this number to three or five, one set of rolls can carry passes for a wider variety of products, and production of the rougher can be greatly increased. Two 14-inch 2-high stands between the rougher and the finishing stands replace the passes lost on the 18-inch mill. A vertical edging mill is used for edging flat products.

Facilitates Handling—To facilitate mechanical handling in the finishing mill, all stands are two-high, and passes are generally limited to one in each stand. To make up additional passes required for $\frac{3}{8}$-inch rounds, strip, skelp and rods, two 10-inch continuous stands are located after the 12-inch finishing mill. A six-stand continuous mill is employed for finishing rods.

On these various mill combinations, it is planned to produce rounds, $\frac{3}{8}$ to 2 inches; angles, $\frac{3}{4}$ x $\frac{3}{4}$ x $\frac{1}{8}$ by 3 x 3 x $\frac{1}{2}$ inch; flats, 4 x 9 inches; strip and skelp, up to 10 inches wide and 0.102-inch thick; and rods from No. 5 up to 5/16-inch diameter.

Space has also been left available, and the roughing and continuous stands have been arranged to make practical the addition of continuous finishing stands in the future, in case a continuous strip mill is required.

The furnace serving the 18-inch mill has a run-in table arranged for end charging, and a double furnace pusher which can be mechanically interlocked to push 15-foot billets or can be separated to push two lines of shorter billets. The 18-inch roughing mill approach table includes a hydraulically-operated disappearing dog transfer for pulling over the heavy slabs which are used for rolling flats and skelp. On the back side of this 18-inch mill stand is a hydraulically-operated tilting table and automatic dragover to move the bar from pass to pass. To the right of the tilting table is a stationary nontilting runout table which facilitates the rolling of more than one bar at a time in this stand.

Operated by Hand Wheel—The approach table to the 14-inch continuous mill provides two sets of aprons and troughs, either of which can be placed in position by operating a handwheel. One set of aprons and troughs incorporates an automatic switch for feeding four lines of rod mill passes; another set of aprons and side guards is used for slabs and billets for rolling flats, structurals, and merchant bar. Just beyond the table is a vertical edging stand, and beyond that are the 14-inch continuous intermediate mill stands.

All stands of the 14 and 12-inch cross country mills have totally enclosed worm-operated screwdowns with a handwheel and clutch for operation. They have bottom roll wedge adjustment and the window clamps for both sides of the housings are controlled from the operating side. Thus, all roll adjustments, vertically and horizontally, can be made from the operating side. The housings also have a heavy shear pin arranged for joining the caps to the housing posts, giving the rigidity of a solid housing combined with simplicity in roll changing as the caps may be tilted back on one side and need never be removed from the housings. The high-speed flying shear is capable of cutting material to cooling bed lengths at speeds up to 1800 fpm.

Vibrated and Coiled—Skelp or flat is twisted on edge after leaving the mill, and is vibrated onto a traveling apron conveyor. As the front end ap-

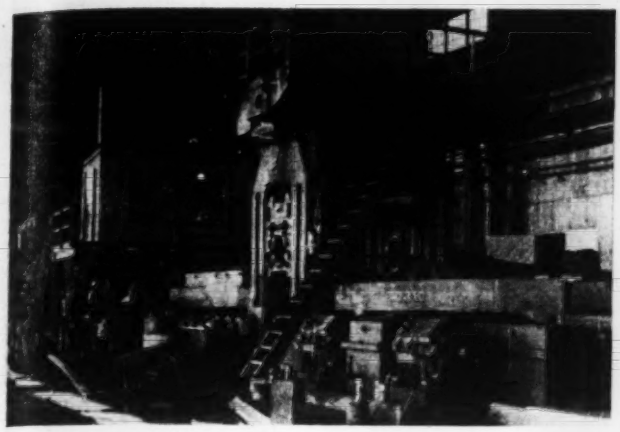

Fig. 3—Thirty-two-inch blooming mill, in course of erection, which supplies semifinished shapes to the merchant mills

proaches the end of the conveyor, an operator pulls it into a vertical shear, where the end is cropped, and then pulls it through a set of back tension rolls and inserts it into a vertical spindle coiler. Finished coils are transferred mechanically to the conveyor table. Rollers are provided to prevent damage to the edge of the material.

At the end of the conveyor there is an automatic unloader which transfers the coils to the coil bundle holder. After a number of coils have been placed on this holder, it is rotated 180 degrees, making a new loading arm available and presenting the assembled bundle for removal by crane or fork truck.

The run-in table of the merchant bar and structural cooling bed is provided with lifting aprons to brake the material immediately before kick-off. Bars drop into a straightening notch and from here they are transferred by lifting pungers onto the cooling bed proper.

This cooling bed consists of heavy bars, machined throughout, and accurately aligned to provide commercially straight bars direct from the bed. Each bar has a notched and flat surface, either of which can be placed in operating position by a motor-operated drive. Notched surfaces are used for merchant bar and narrow flats and the flat surfaces for wide flats and structurals. Flats up to 10 inches wide can be handled by this bed. Bars are advanced from notch to notch by a shuffling motion between alternate bars, and the drive is so arranged that the individual bars are balanced against each other, neutralizing the weight of the bed, and making for smooth and rapid operation. Bars from the cooling bed are assembled on the shear approach table by the shuffle bars. The shear approach table as well as the cold bar shear are located at the end of the 250-foot long cooling bed.

Dual Adjustment Possible — A small structural straightener of the overhung type for the light structural material has vertical adjustment of all top rolls and axial adjustment of all bottom rolls. A cold saw for cutting small orders has an automatic hydraulic clamp which precedes the saw blade and holds the material to be cut against an anvil until the cut is completed. Feed of the saw is also hydraulic and is freely adjustable.

A 32-inch blooming mill, Fig. 3, supplies raw material for the merchant mill such as ingots from 14 x 14 inches to 23½ x 23½ inches, slab ingots up to 16 x 27 inches, billets down to 4 x 4 inches, slabs up to 30 inches wide, and beam blanks for 18-inch maximum beams, the latter to be produced on a proposed future structural and rail mill.

Carbide Tips Sandwich Brazed

One method of brazing carbide tips to the shank is the sandwich braze, frequently used in the case of irregularly shaped tips, enclosed tips and in larger sizes. Reason for the use of this joining method is that the high plasticity of the shim material absorbs most of the stresses which may be set up during the brazing process itself by the high-working tip temperatures in actual use and even possibly during resharpening.

Sandwich brazing process developed by General Plate Division, Metals & Controls Corp., Attleboro, Mass., incorporates a sheet of ductile metal between two sheets of brazing material, this combination being bonded into one sheet and placed between the tip and the shank. The material is being called Bondwich.

As complete wetting is said to take place at the brazing temperature, a minimum of voids in the final braze is noted. The company also states that the danger of flux inclusions are almost completely eliminated by the use of a surface pattern designed to act as a series of flow-propagating capillary channels. The combinations of shim and brazing materials and ratios of thicknesses which can be made are virtually uneliminated.

How To Design Coned Disk Springs

Sixth in a Society of Automotive Engineers' series on springs is a manual on the design and manufacture of coned disk springs. Three ways to design this type of spring, sometimes called the Belleville spring, and two ways to make them are detailed. They are used as spring washers to give constant bolt loading or gasket pressure, in tailstock centers to take up expansion of work at constant thrust and in clutches to apply load to friction plates.

Load-deflection characteristics can be varied, the manual points out, by changing the ratio between initial cone height and thickness. Belleville springs may be used singly, or stacked in parallel or series. Three ways to calculate coned-disk spring stresses and deflections are shown. It is stated that springs generally are made of carbon or alloy steel, but for special purposes, stainless alloys or nonferrous materials may be used.

Springs are offered in two quality grades, commercial and special grade. Allowable height variations and manufacturing tolerances are tabulated. Copies of the manual are available from SAE special publications department, located at 29 W. 39th St., New York 18, N. Y. for $1.75 to members, $3.50 to nonmembers.

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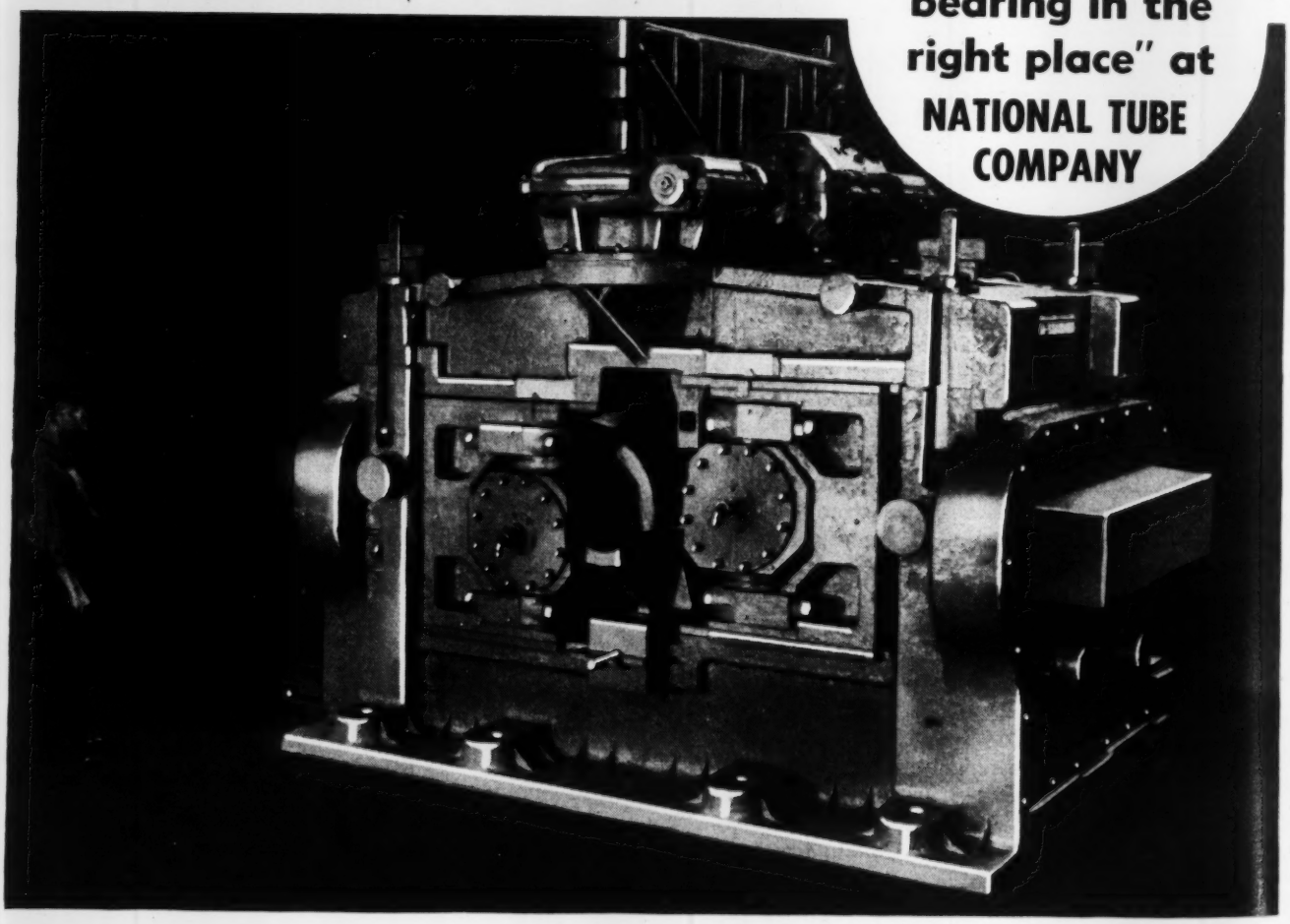
SKF

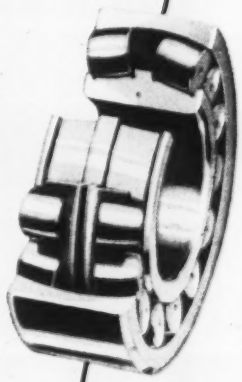
"puts the right bearing in the right place" at NATIONAL TUBE COMPANY



Heavy traffic--
70 TONS worth for each SKF-equipped car

Seventy tons of ingots bear down on the eight wheels of National Tube's large size ingot cars. To handle the stresses set up by such a load the Carnegie-Illinois Steel Corporation, car builders, turned to SKF. Each wheel of the 111 ingot cars was equipped with SKF Spherical Roller Bearings—a total of 880 bearings. Warpage or deflection under heavy loads will not reduce their capacity to absorb highest radial and thrust pressures. Friction due to internal binding is not increased. No adjustment for running clearance is necessary. Ingots move smoothly, quickly, with minimum car down time.

It's another example of the *right* SKF Bearing for the job.



REELING tubing's no job for softies
...SKF takes it in stride

Reeling machines, built for the National Tube Company by Aetna-Standard Engineering Company, are heavy-duty machines in every sense of the word. They act as the driving and twisting force for the feeding of tubing—subject bearings to unusually heavy loads. Two SKF Spherical Roller Bearings per neck are used, a total of eight on each machine. These bearings permit major space economies without compromising shaft strength and bearing capacity.

SKF Bearings Smooth The Way For Peak Tonnages Rolling Through America's Steel Mills.

Table rolls, gear drives, reels, coilers, hot and cold saws—these and every other type of steel mill equipment must give exceptional service today. Bearings are increasingly important.

Strict control of manufacture, rigid inspection, and advanced engineering techniques are your assurance of SKF Bearings' ability to take tough vibration and shock treatment. SKF Bearing installations function efficiently, economically, with complete dependability.

SKF INDUSTRIES, INC., PHILADELPHIA, PA.
—the Pioneers of the Deep Groove Ball Bearing, Spherical Roller Bearing, Self-Aligning Ball Bearing. 7122

SKF
BALL AND ROLLER BEARINGS

8 REASONS WHY SKF IS PREFERRED BY ALL INDUSTRY

Integrity — Craftsmanship — Metallurgy — Tolerance Control
Surface Finish — Product Uniformity — Engineering Service — Field Service

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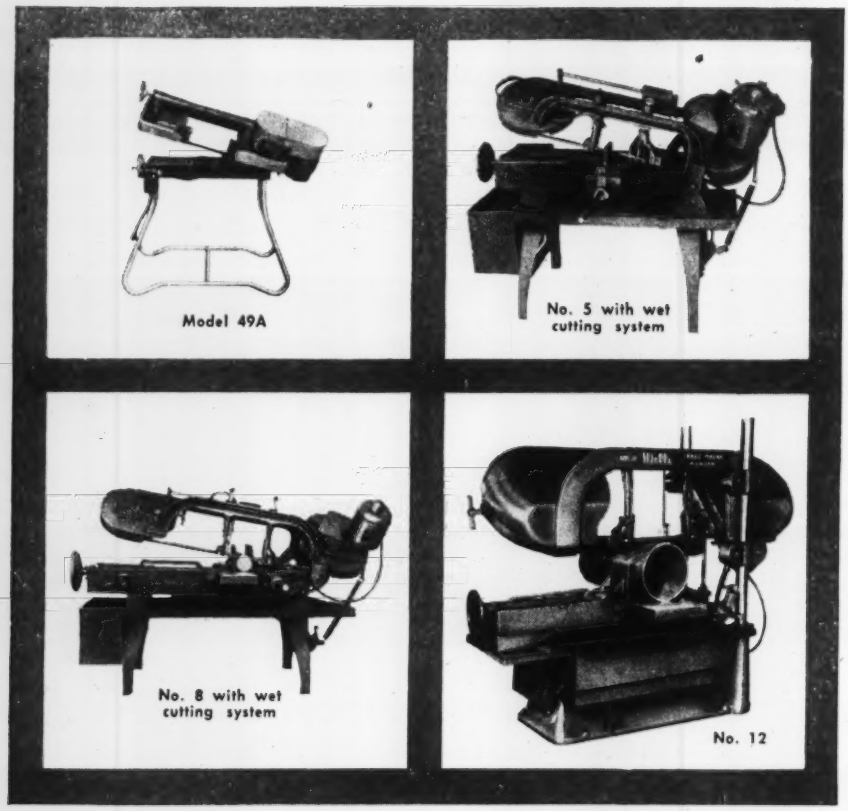
One of these four Wells Saws is the answer to your metal cut-off problems



IN the recently expanded line of Wells horizontal metal cutting band saws there is a standard model to meet every cut-off need up to 12" x 16" . . . and special models for larger jobs. This means that the cost-cutting advantages of modern, continuous band saw cutting are available for all shops, regardless of size! Choose from the following, the saw that best suits your requirements:

MODEL 49A—Portable, economically priced unit yet capable of a man-sized job in any shop. Capacity: 3½" dia., rounds; 3½" x 6" rectangular.

No. 5—All purpose utility saw. Capacity: 5" dia., rounds; 5" x 10" rectangular. Available with or without wet cutting system.

No. 8—General maintenance or production saw. Capacity: 8" dia., rounds; 8" x 16" rectangular. Available with or without wet cutting system.

No. 12—Heavy-duty wet cutting production saw with automatic cutting cycle. Capacity: 12¾" dia., rounds; 12" x 16" rectangular.

Our 25th year of service

For automatic precision repetitive cutting Wells No. 8 and No. 12 saws can be equipped with Wells-O-Bar Feed Master stock projection units.

Write today for descriptive literature and information on the Wells Saws which you need for your job requirements.

Wells SAWS

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Products by Wells are Practical

METAL CUTTING BAND SAWS

WELLS MANUFACTURING CORPORATION
1515 FILLMORE ST., THREE RIVERS, MICHIGAN

Heat Resistant Alloy

(*Continued from Page* 94)

Easy To Weld—Hard To Machine—The higher nickel grades are easiest to cast and have satisfactory welding and machining characteristics. Fluidity is favored by the higher carbon and silicon contents common to these grades.

The straight chromium alloy (HC) represents the other extreme because of its high melting point and brittleness at room temperature which exaggerates the straightening and welding problems. The austenitic (or essentially austenitic) Cr-Ni alloys (HF, HF, HH, HK) handle well but the same degree of surface perfection is relatively difficult to achieve. Straightening and welding characteristics are satisfactory.

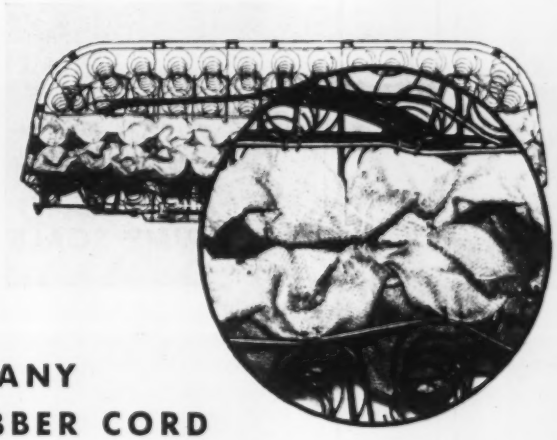
Machinability is more difficult, but only tapping operations are not readily performed. In the cases where tapping operations are necessary, thermal treatments are known which assist materially. All such alloys machine with difficulty compared to carbon steels, as do the low carbon wrought stainless alloys. In general, relatively slow speeds and heavy feeds should be utilized. With experience, machining is carried out to satisfactory surface finishes and tolerances for high temperature service operations.

High shrinkage characteristics of these alloys establish definite design limitations if proper soundness is to be obtained at a reasonable cost. Extraordinary designs should not be finalized until the alloy foundries evaluate the design and recommend changes.

Application Analysis Simple—IF—The problem determining and utilizing the most economical alloy for a specific application is relatively simple if the data are utilized coupled with the experience of the alloy casting producers. From these data it is usually a simple matter to select the first and second choice materials which should then be correlated with the experience factor of the user and the alloy casting producers. But be sure to have complete information on the application.

One case of a unique failure is a feed pipe for the charging end of a cement kiln. Operating temperature was described as 1800° F and the HH (26Cr 12Ni) alloy was selected. Early failure occurred as shown in one of the accompanying illustrations. Failure is attributed to the thermal stresses due to the unequal temperature of the pipe between the side directed toward the combustion flame (the hotter side)

How do you tie a Spring?



L. A. YOUNG SPRING & WIRE COMPANY USES STALWART-DEVELOPED RUBBER CORD

Confronted with the need for a tough, durable, elastic cord to tie seat springs in one of their many automotive cushions, L. A. Young Spring & Wire Company engineers specified Stalwart Rubber for help. Stalwart's chemists and engineers, despite the many difficult aspects to the problem, compounded a special rubber cord that incorporated all the desired characteristics.

To date, millions of feet of this cord have been delivered and installed in automobile seat cushions without the rejection of a single foot.

The development and production of this cord is another example of Stalwart's ability to supply top quality rubber parts to meet exacting requirements. Today, Stalwart is supplying custom parts to the automotive, aviation, refrigeration, and original equipment manufacturing industries. Thousands of molded, extruded, punched, lathe-cut and die-cut parts are fabricated daily from natural and synthetic rubber stocks (including Silicone rubber) to meet individual as well as S.A.E. specifications. WRITE FOR CATALOG TODAY, and . . .

Specify STALWART . . . For Quality Custom Rubber Parts!

Stalwart Cord Meets These L. A. Young Specifications:

1. Tear Resistance . . . because of possible fracture during fabrication.
2. Chemical Resistance . . . because cord is installed prior to special paint dip.
3. Heat Resistance . . . to withstand oven paint drying process.
4. Flex Resistance . . . to withstand flexing of springs under passenger.
5. Age Resistance . . . because of extreme replacement difficulty if failure occurs prior to life expectancy of cushion.
6. Low Permanent Set . . . to maintain original length during processing operations and functional service life of seat.
7. Low Temperature Resistance . . . so that cord remains flexible at −40° F. to meet world-wide temperature conditions.
8. Abrasion Resistance . . . to withstand contact with metal parts.

STALWART RUBBER COMPANY

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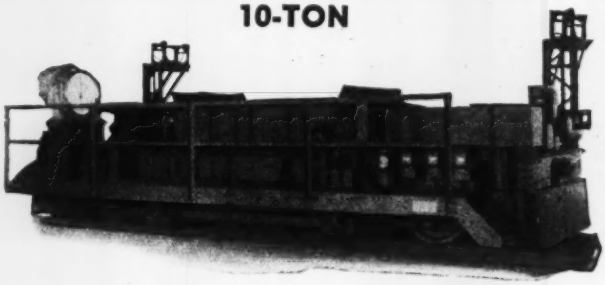
ATLAS

INTRAPLANT HAULAGE EQUIPMENT

SPEEDS PRODUCTIONS—LOWERS COSTS

10-TON

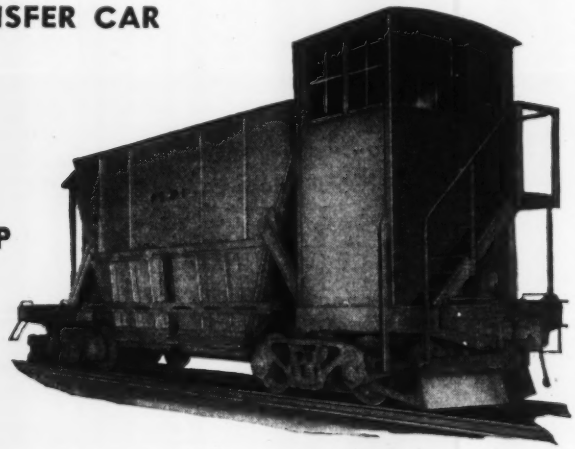


BOTTOM DUMP SCALE CAR

Single Hopper Type, equipped with Atlas All-Steel Roller Suspension Scale provided with Atlas Indicating and Type Printing Recorder. Car has air brakes, air operated discharge gates. Bus-type control with usual interlocks and standard safety equipment.

ORE TRANSFER CAR

SIDE DUMP



Two compartment hopper with separate discharge gates, independently operated from front and rear vision cab. Car is equipped with air brakes, self-aligning bearings and standard safety equipment.

ATLAS BUILDS:—Scale Charging Cars and Ore Transfers; Indicating and Recording Dials for weighing scales; Electric and Storage Battery Locomotives; Coal Charging Cars; Door Extractors; Coke Quenching Cars; Turntables.

ATLAS ENGINEERING SERVICE
IS ALWAYS AT YOUR SERVICE

THE ATLAS CAR & MFG. CO.

and the back of the pipe.

The cracks probably occurred when the pipe was coming up to temperature and maximum temperature differentials existed. Because of deposits of fines on the pipe, equilibrium temperature turned out to be approximately 1500° F. The solution was a material with superior hot ductility which would not embrittle in service. The HF grade was selected for trial and proved satisfactory.

Changed Design Does Trick — Another accompanying illustration shows large rotary retorts of a special design utilized to anneal extremely small parts. The alloy involved was the 12 per cent Cr 60 per cent Ni type selected initially because it was known that the thermal shock would be severe when a cold charge was added to the hot retort. Failure is by cracking after extreme deformation.

This design was abandoned quickly since it was immediately apparent that excessive temperature differentials developed after charging a new batch. The solution was mainly one of design involving a straight cylindrical barrel with relatively low lifting flights inside for a desired mixing action. Charging procedure was also altered to distribute the cold charge material more uniformly over the retort inner surface.

The ultimate alloy type probably has not been developed and further trials are continuing. Presently the HW (12 per cent Cr 60 per cent Ni) and HH (24 per cent Cr 12 per cent Ni, stably austenitic type) grades are providing approximately equivalent service on a cost-per-operating-hour basis.

Truck Safety Code Published

Safe practices in the design and use of industrial power trucks have been established by a nationwide agreement among users, safety engineers, and manufacturers of these trucks and are being published as a safety code for industrial power trucks. Bearing approval as an American standard (B56.1-1950), it applies to industrial trucks of both the driver-ride and driver-lead types. It does not apply to motor vehicles intended for operation on highways.

Development of these standard practices for safety was proposed in 1946, the purpose being to promote safety of personnel and equipment by establishing authoritative and uniform fundamentals in certain elements of design, and by setting up rules for the operation and maintenance of industrial trucks.

New standard is intended to pro-

vide a uniform basic code and a guide for state, municipal, and other governmental authorities in formulating safety rules and regulations. It was developed under the technical leadership of the American Society of Mechanical Engineers. Membership on the formulating committee included representatives of more than 20 other national organizations.

The new American standard is available either from American Standards Association, 70 E. 45th St., New York 17, or from American Society of Mechanical Engineers, 29 W. 39th St., New York, for 85 cents.

Refractory Is Reinforced

Costly heat loss resulting from the water-cooling of skid pipes in underfired steel mill heating furnaces is said to be considerably reduced by Ka-Weld pipe insulation, a refractory material reinforced with heat-resisting alloy mesh wire and preformed in lengths and diameters to fit standard pipe sizes.

A product of Bloom Engineering Co. Inc., Pittsburgh, the insulation has been tested to show the following: With a furnace temperature of 2400° F, 34,000 cubic feet of natural gas per hour can be saved by covering 250 feet of bare pipe with the material. It is claimed that this reduces the demand upon the stack, burners and fan and increases production by about 20 tons per hour.

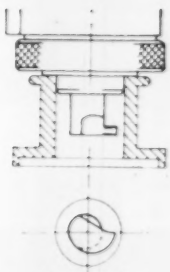
The wire mesh, imbedded in the refractory so that it is not exposed to the highest temperatures and therefore not subject to rapid deterioration, imparts strength and rigidity to the refractory and also provides a simple means of fastening insulation to the pipe.

At the present time, service life has not been determined, although it is reported that some installations have been in service eight months with no indications of serious deterioration.

How Big Is a Caliber?

In these days with "police action" activities making headlines such words as ".30 caliber carbine" and "16-inch gun" are again creeping into conversation. Just how big is a caliber? In small arms, caliber is diameter which, roughly translated means 1 inch. Thus when we speak of a .30 caliber carbine or light machine gun, it means that the pieces fire a projectile three-tenths of an inch thick. A .45 caliber pistol fires a bullet four and half tenths of an inch. The Navy, however, uses caliber differently—to measure the length of the bore of a big gun. Big Navy guns are usually

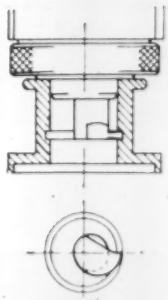
One RECESSING TOOL...
Any RECESSING JOB!



● Cut Recessing Costs on your Drill Press . . . Boring Mill . . . Turret Lathe . . . Radial Drill . . . etc. The **ALL NEW** Series "R" Maxwell Recessing Tools provide unlimited versatility.

SIX sizes are stocked for immediate shipment. Shanks to fit your machines are instantly interchangeable. Capable of taking cuts at extremely high rates of feed, the new Maxwell tools feature a micro-adjusting collar which facilitates rapid and accurate recess diameter control to within 0.001-inch or 0.050-inch per tool revolution. Cutters can be supplied to make single or multiple recessing in a single operation.

Cut location can be made from either top or bottom surfaces. The ball-bearing pilot facilitates use of Series "R" Recessing Tools with existing fixtures. If fixtures are not used, ball-bearing pilot will stop on the workpiece surface to accurately locate the cutter.



Hardened tool-steel wearing surfaces guarantee maximum tool life. Cutting action is smooth and requires only finger-tip feed pressure. Series "R" Recessing tools are regularly furnished having cutter ratio of either 1:3 or 1:1. Hole in tool block permits flow of coolant or lubricant to cutter.

Standard Series "R" Recessing Tools are available to cut recesses from ¼ to 4¼ inches in diameter. Write today for catalog "R" . . . .

Precision boring with MASTUR heads is described in catalog PBH. These inexpensive tools feature large capacity, adjustability and accuracy. Specifications are charted.

Production Boring with the E-Z set line of Boring heads is subject of catalog No. 30. Complete line of tools is shown. Prices, capacities and specifications are charted for reference.

THE MAXWELL COMPANY

570 BROADWAY BEDFORD, OHIO

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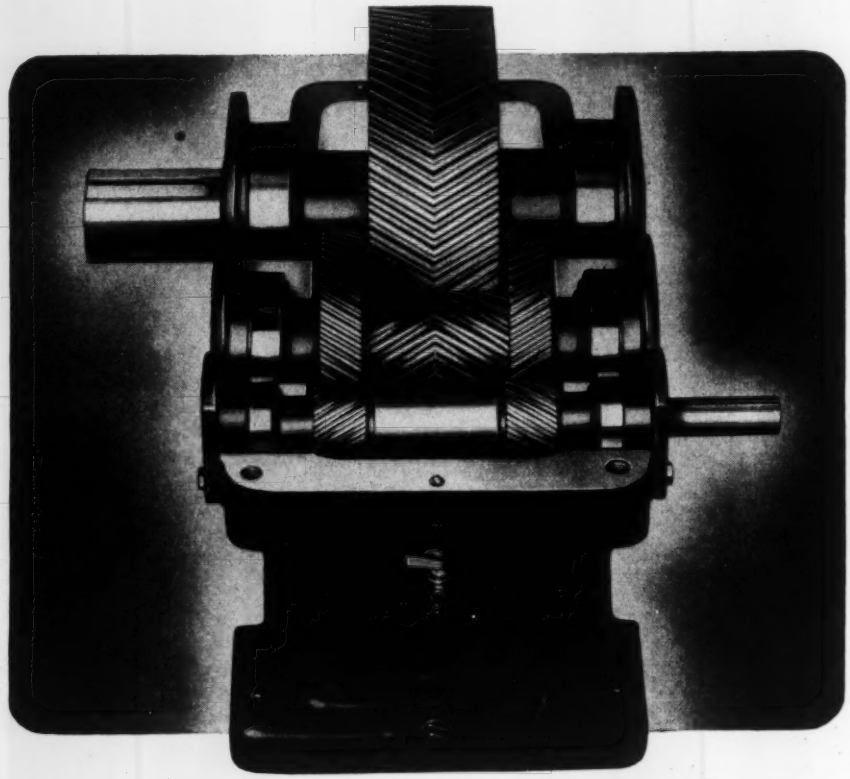
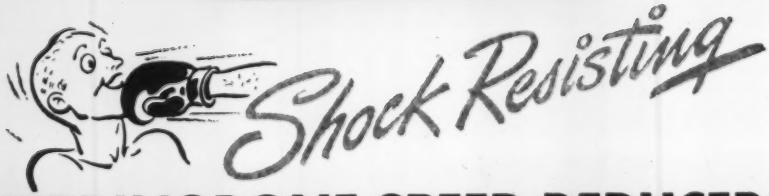




HERRINGBONE SPEED REDUCERS
by Horsburgh & Scott

● Every Horsburgh & Scott Speed Reducer is designed for 100% momentary overload without injury. Making this possible are such features as: Accurate Sykes type heavier, wide face gears with continuous double helical teeth, giving increased bearing surface . . . finest anti-friction bearings . . . rugged shafts and bearings . . . heavy, ribbed housings . . . close tolerances and rigid inspection. Oversize bearings provide tremendous overhung load capacity on the low-speed shaft. Even under heavy shock loads, here's quiet, smooth operation at its best.

Send note on Company Letterhead for Speed Reducer Catalog 46

THE HORSBURGH & SCOTT CO.
GEARS AND SPEED REDUCERS
5112 HAMILTON AVENUE • CLEVELAND 14, OHIO, U. S. A.

designated by their diameter in inches, followed by the length of the gun in calibers. For example, a 16-inch, 45-caliber gun, without decimal point, means the gun is 45 times 16 inches or 60 feet long.

Press Forms and Cures

Designed for service requiring a pressure curing cycle, is a hydraulic press in operation at Apex Electrical Mfg. Co., Cleveland. From the dies is removed a liner for an automatic washer which has been finish-formed and cured.

A single electric control on the press, built by Beatty Machine & Mfg. Co., Hammond, Ind., provides rapid approach to a preset slow-down position, slow-or-pressing speed to dwell position, dwell for curing, and rapid return to up position. The complete cycle is automatic. Inching control is also provided through a selector switch.

For versatility, the following adjustments are provided: Location of slow-down and up-stroke limit switch cams; variation of slow or pressing speed down to 1 inch per minute; variation of pressure point at which timer is energized; and variation of timer cycle between 2 seconds and 20 minutes.

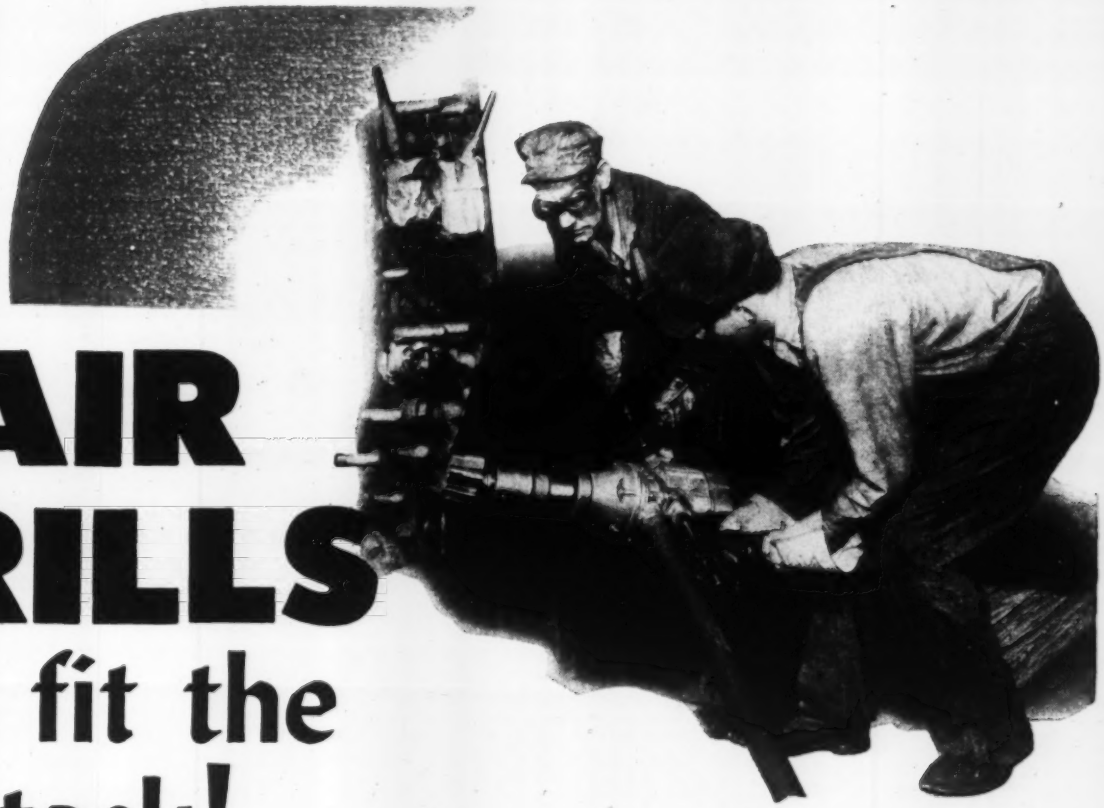
Metal Powder Assn. Proceedings

Among the subjects covered in the proceedings of the sixth annual meeting of the Metal Powder Association recently released are a new type of stainless steel powder, application of iron powder in radio and television circuits and the market outlook for metal powders. Other papers deal with cost accounting for powder metallurgy, thermochemical coated metal powders, metal powder parts as friction material. Published as a 92-page booklet, the proceedings also include a transcript of the informal discussions which took place at the meeting held in Detroit in April, 1950. Copies are available for $2.50 from the association, 420 Lexington Ave., New York 17, N. Y.

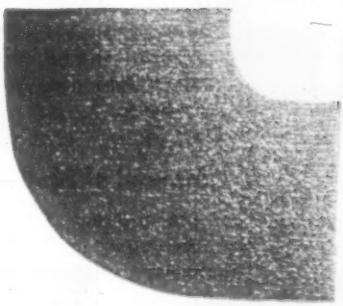
Hanging from the Ceiling

Threefold advantages have been derived at the Springfield, Mass., plant of Harvey-Whipple Inc., by hanging its Flexarc-65 alternating current welding machines from the ceiling. Savings in floor space, better ventilation and protection from bumping and jarring are the advantages. In addition, long across the floor runs of welding cable are usually not required, this extending the cable life.

Because of the inverted installa-



AIR DRILLS to fit the task!



When the task can best be done by an abundant flow of smooth power, use Ingersoll-Rand Air Drills. Whether it's running a large tap as shown above, or drilling small holes in very light sheet metal, there is an I-R Air Drill available to handle your job.

Over one hundred different sized I-R Air Drills, all realistically designed and precision built, are ready and waiting to handle practically any drilling, reaming, or tapping job you encounter.

Equip your workmen with I-R Air Drills today. A call to your Ingersoll-Rand branch office will bring you the facts on the complete line of I-R Air Tools—ask one of our Air Tool Specialists to *show you* how Air Tools now pay for themselves nearly twice as fast, and enable the workman to do more work with less effort.

Send for Form 5010A, containing over 30 pages of remarkable time and money savings made with Air Tools.

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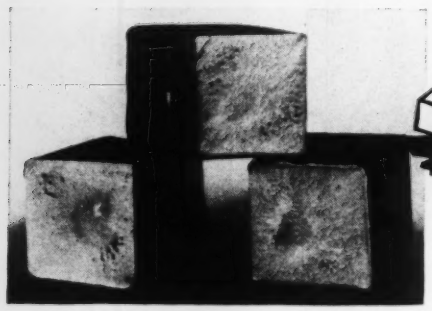
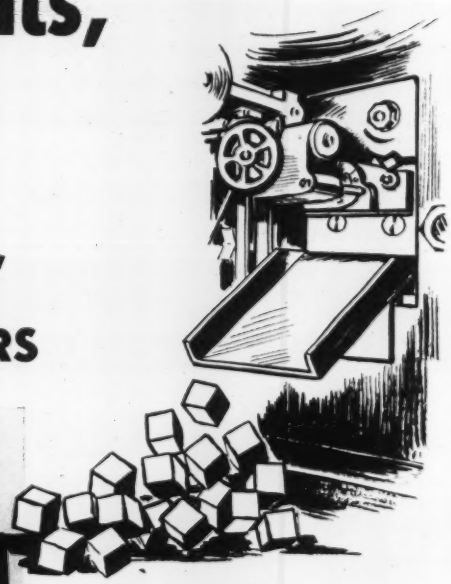
CLEAN, QUICK CUTS to "Pile Up" Your Profits, Too!

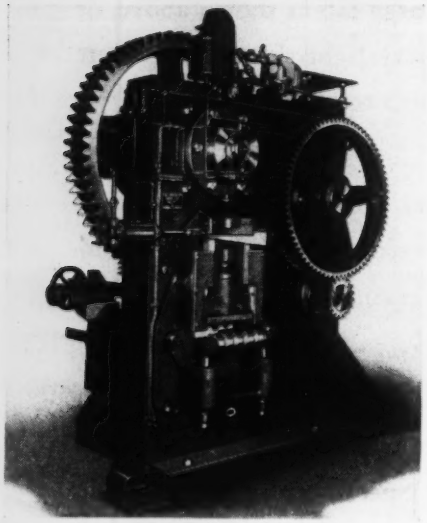
with

"Buffalo"

BILLET SHEARS







If you could see the No. 17 Shear "bite off" SIX 9" squares (.20 C. steel) in a minute, you'd see how this speed "piles up" profits! And "Buffalo" Billet Shears are built to CONTINUE delivering this fast, powerful shearing action—many are still on active 24-hour service after a good many years. A complete range of 11 sizes to meet your most particular requirements on flats, angles, channels, squares and rounds. For instance, for high production work "Buffalo" Billet Shears can be arranged for Multiple cutting, like the No. 10 shown at the left, which has air-operated clutch, counterbalance and automatic hold-down.

Write for Bulletin 3295-A

BUFFALO FORGE COMPANY

158 Mortimer St. Buffalo, N. Y.

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

tion, covers of the machine, made by Westinghouse Electric Corp., Pittsburgh, can be removed to facilitate inspection and allow better circulation of the ventilating air. Ventilation is by natural air convection current. The current indicator dial is easily read and adjusted in this position.

Instrument Tests Insulation

Developed as an aid in testing insulation of electrical components and assemblies, such as coils, relays, motors and appliances, is the current limited high potential tester, an instrument developed by General Electric Co., Schenectady, N. Y. Special applications of the instrument have been reported for detecting flaws in surface coatings of paint, lacquer and sheet materials of a nonconducting nature.

Output current of the tester is limited to a value below the maximum which an operator can let go if he should accidentally come in contact with the test probes. This low output current value also insures nondestructive testing.

Indicating instrument reads the voltage across the equipment being tested and the measurement is not affected by impedence drops in the internal circuit of the tester. Overloading causes no measurement of errors and does not damage the instrument.

Manual of Equivalent Valves

Embracing 175 pages of data on equivalent valves, listing those made by eighteen manufacturers, is a manual compiled by H. Gordon Hawes and made available by Hooper Publishing Co., San Francisco. Listing shows which valves are equivalent, also their design and variations. It is intended as a ready-reference for engineers, purchasing agents and engineering personnel who develop specifications or purchase this type of equipment.

Paints for Underwater Service

This is the subject of a report compiled by several technical societies in Great Britain which gives detailed results of tests made on 68 specially formulated anticorrosive compositions. These comprise systematic variations of mixtures of basic lead sulphate, white lead, aluminum powder, Burntisland red and barytes.

Available from British Iron and Steel Research Association, 11 Park Lane, London, W. 1, England, free of charge, the report details the test

procedure. Two coats of an anticorrosive composition were applied to the specimens and in each case the painting system was completed with a final coat of an antifouling composition to an agreed formulation.

Eight of the compositions were placed in the very good group, all of which appear to be improvements upon earlier formulations. Best performances were given by paints bound in chlorinated rubber, closely followed by a phenolformaldehyde-stand oil-tung oil medium.

Stainless Wall Progress Report

An interim progress report on proposed methods of curtain wall construction in which prefabricated sections of stainless steel sheathing backed by insulating material are used in the construction of exterior walls of multi-story buildings, is announced by Allegheny-Ludlum Steel Corp., Pittsburgh.

Examples used in the booklet have been developed over a period of 2 years by the company in co-operation with manufacturers, contractors and architects. Scale drawings illustrating existing and planned types of stainless steel curtain walls are presented, with attention given to such details as facings, insulation, joints, vents, window sections and shapes and textures. A discussion of building codes and tests affecting stainless steel curtain wall construction and what is being done to meet them is included.

Stays In Oil and Likes It

Geotrol is the name of a new gasoline and oil-resistant wire announced by General Electric Co., Schenectady, N. Y., designed for lighting circuits in places where oil and oil products are likely to cause deterioration. Conductors are insulated with vinyl compound and sheathed in a jacket said to be resistant to the petroleum products. Conductors are available in black, white, red, green, orange, blue and yellow in sizes 14, 12 and 10 awg.

Spring Motor Is Long Running

Constant output torque and long running time on a single winding are factors inherent in Neg'ator spring motors, an elastic member made from prestressed flat spring stock by Hunter Spring Co., Lansdale, Pa. Basic type B spring motor is made up of three basic parts, the spring itself and two spindles or spools. The Neg'ator band coils on both spindles in opposite rotational direction.

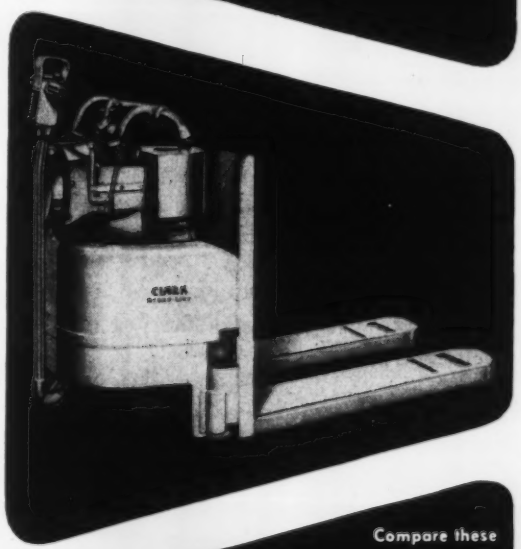
Biggest Materials Handling news in years

CLARK'S REVOLUTIONARY *New* POWERED HAND TRUCKS

• GAS OR ELECTRIC POWER • SHORTEST TURNING RADIUS • MORE POWER! • MOTORS IN THE DRIVE WHEEL

1 Electro-Lift

New-type compound motor develops more power than any other electric truck. Ample reserve power—high gradability. Automatic acceleration. Soft, dynamic braking. Requires minimum operator effort because speed variations are negligible. 19-plate batteries.



2 Hydro-Lift

Gas-engine drives variable-displacement hydraulic pump which drives constant-displacement hydraulic motor with unequalled smoothness and controllability. 24-hour ramp service. Automatic torque multiplication—big reserve power. Effortless finger-tip positioning of directional controls.

One Basic Design

Same rugged frame for both power types. Shortest wheelbase. Larger (14") drive tire carries greater share of load—lessens weight on rollers—less wear on rubber and floor. Greatest underclearance. Compact drive unit fully enclosed. Largest main carrier bearing of all hand trucks.

Compare these great new machines with all others — as to what you get for your money! To get all the facts, send for our hand-truck booklet — yours for the asking. Use the coupon.

CLARK ELECTRIC AND GAS POWERED FORK TRUCKS

AND POWERED HAND TRUCKS • INDUSTRIAL TOWING TRACTORS

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Please send New Powered Hand Truck Book.

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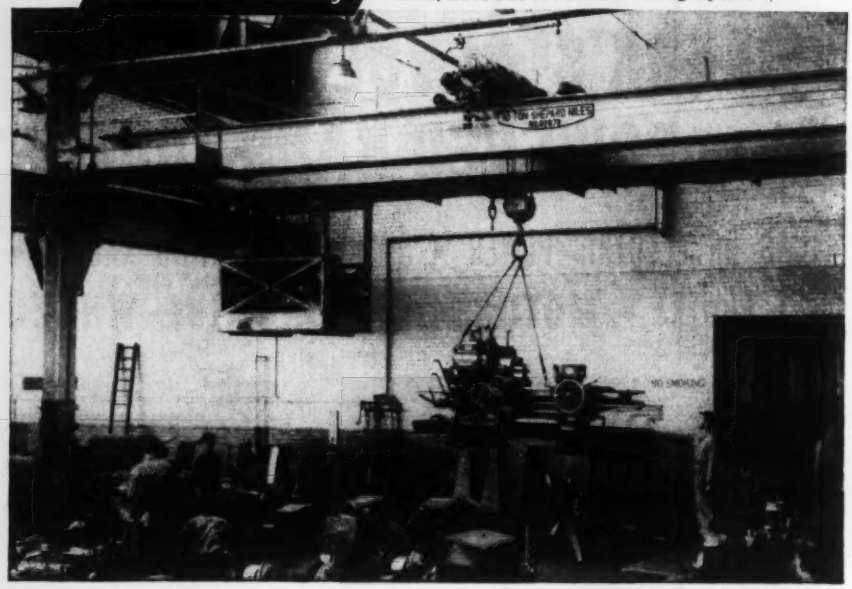
For Lowest Cost Per Load-
Use Dependable
Thru-the-Air Handling

For this installation, operating conditions called for rapid travel over a large area. Controlled by operator in the cab, this Shepard Niles 10-ton, welded-beam crane, with main and auxiliary hoist units, travels at 450 F.P.M.—bridge speed.



we start by asking "what"

WHAT are *your* problems? Under WHAT conditions will *your* crane be operated—intermittently, or under fairly constant conditions? WHAT are the operating speeds necessary to meet *your* productive cycle?

Your answer to these and similar questions will enable us to engineer your installation so that it will give you the best, and longest service—at the lowest cost per load over the years.

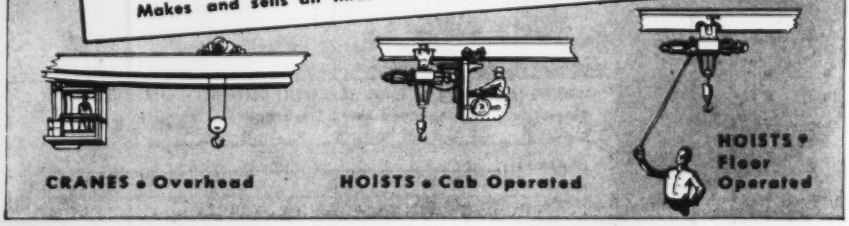
Be sure you get the crane best qualified to do *your* job. It's wise—and costs you nothing—to get the facts first, rather than to make expensive changes later.

May we place our experience of a great many years of successfully designing all types of crane installations at your disposal?

Shepard Niles

CRANE & HOIST CORPORATION

Makes and sells all three lifting tools for airborne shop loads



CRANES • Overhead

HOISTS • Cab Operated

HOISTS • Floor Operated

358 SCHUYLER AVENUE • MONTOUR FALLS, N.Y.

Feature which permits the design of such spring motors is the ability to exert constant or even decreasing force with increasing deflection. This is possible because only a small increment of length of the long coil is being deflected from its natural position at any instant, whereas the entire length of a conventional power or spiral spring is always involved in generating that spring's torque. Energy is stored in this Hunter spring by deflecting each increment of length in succession from its natural radius to a larger radius.

Establishes Electrical Unit Value

The 81st Congress has given formal statutory sanction to a revision of the practical system of electrical units. Values adopted for these units, for the most part, resulted from research by the National Bureau of Standards; the present legislation was proposed by this bureau.

Changes in magnitude of the units are small, in no case larger than 1/20 of one per cent, but the new law puts the values on a clear and unambiguous basis which assures closest practical agreement between electrical and mechanical units. The new act is similar to the old law in defining the fundamental practical units as multiples of the units of the centimeter-gram-second electromagnetic system. They are also component parts of the meter-kilogram-system which is being widely accepted in textbooks and engineering practice. It also defines basic photometric units, the candle and the lumen, not previously defined by law.

Details Red Lead Vinyl Paint

Red Lead Technical Letter No. 5, published by Lead Industries Association, New York, gives information on two fast drying red lead anticorrosive paints of the vinyl and coumarone types. Vinyl coating is said to be suited for protection of steel surfaces exposed to fresh and salt water and to highly corrosive atmospheric environments. Coumarone type is for use with a variety of antifouling paints for protection of steel ship bottoms and continuously immersed marine structures.

Data Brought Up-to-Date

Previous compilation on wrought stainless alloys has been brought up-to-date by the inclusion of a comprehensive new section devoted to cast alloys in an 84-page publication of American Society for Testing Materials. New tables on the compos-

KEOKUK ELECTRO-METALS COMPANY
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CASE No. 311
Automotive Assembly Plant

$1700 cash savings

per year with a $1200 installation.
Also improved employee morale.

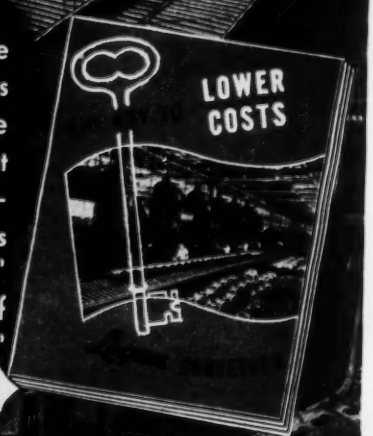
(a) Savings in Effort (estimated) 35%
(b) Savings in Time (estimated) 40%
(c) Savings in Space (estimated) 15%

QUOTING CUSTOMER'S* STATEMENT:

"We have a $1700 cash savings per year with a $1200 Logan installation, resulting in savings in effort of 35% and time 40%. We were confronted with a difficult setup in our Shipping Department and Claims Receiving Department due to their being combined to service automotive dealers in one location. We set our plant engineer and time study departments to work on the problem. The answer was Logan gravity conveyor as the area allocated was limited. An alligator switch solved our problem of routing the materials to the proper location. The dealers accepted new parts on their vehicles and brought in defective parts at the same time. We have experienced no delays, and upkeep is negligible. The morale in this department improved as a result of the installation."

*Name on Request

Down-to-earth facts cannot be denied. So the dollars and cents savings quoted in the above case history are of particular interest to the prospective user of conveying equipment. Logan engineers "take the gamble out of handle." Write today for your copy of book "Key to Lower Costs."



Logan Conveyors

LOGAN CO., 535 CABEL ST., LOUISVILLE, KY.

tions and properties of the wrought corrosion-resistant and heat-resistant chromium and chromium nickel steels and alloys castings are divided into two parts: Wrought alloys and cast alloys.

Data for the different steels have been condensed into the simplest form to provide a ready reference for the maker and user of steels. Copies are available from the society, 1916 Race St., Philadelphia 3, Pa., for $2.50.

Finishes Transmission Cases

With automatic transmissions drawing top interest in automobile circles special machines are being developed and put in operation for machining many of their components. Typical of these is a special machine tool delivered by Cross Co., Detroit, for drilling, reaming and spot facing of automatic transmission housings.

Machine is a 5-station dial type with power driven index table which allows one operator to finish 85 pieces per hour at 100 per cent efficiency while performing 29 operations. The control unit with Toolometer stops the machine when any tool requires changing and groups the changes to reduce down time. Preset tools are said to further reduce down time by eliminating adjustments for tool changes.

Cures Paint Overspray Miseries

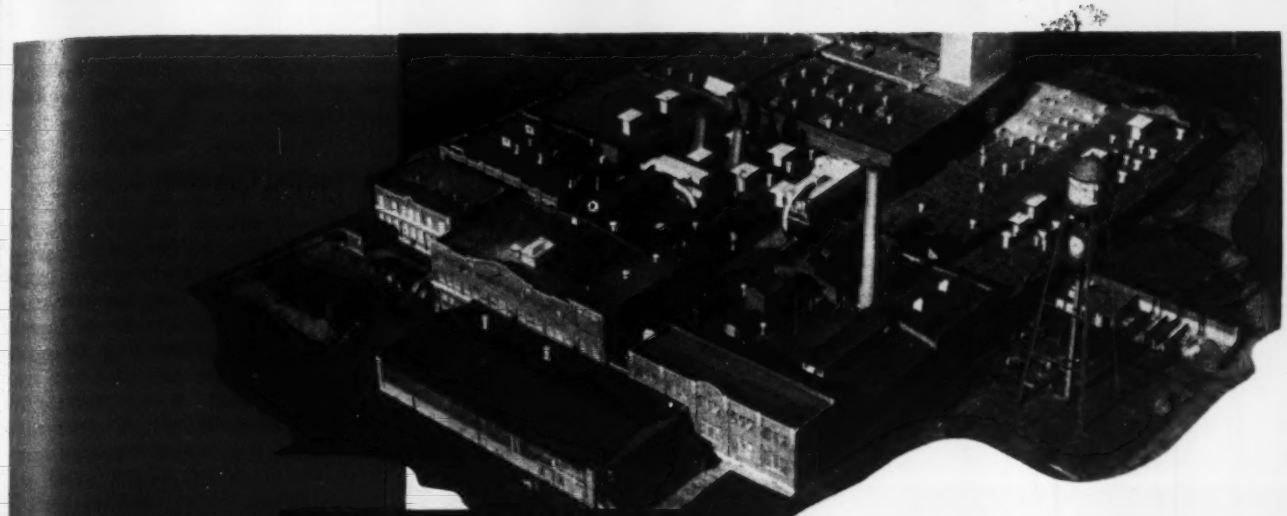
Here seems to be the answer to the problem of protecting spray booth recirculating systems and exhaust fans against clogging caused by paint overspray.

Dearborn Chemical Co., Chicago, through a recently instituted service, will make a survey for any plant using water wash spray booths or planning to install them. Based on the paint or paints used in the booth and an analysis of the water supply where necessary, the company will recommend a specific formula, which, when properly used, is said to provide protection for exhaust system and recirculating pump.

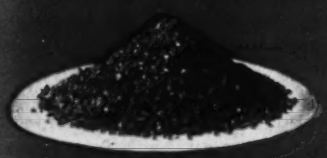
Internal Form Tool Manual

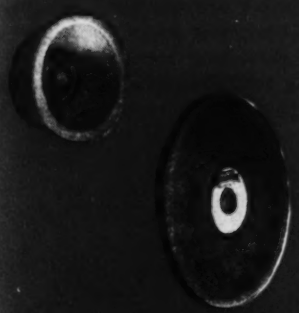
Describing the use of recessing tools for internal forming operations on automatic machines is a new manual which utilizes photographs, diagrams, sketches and cutaway illustrations to indicate construction features.

Available from Maxwell Co., Bedford, O., the manual, designated as DB, describes the recessing tools in detail and their use in performing



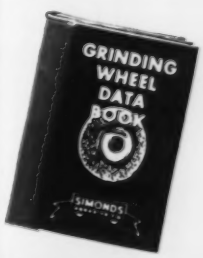
SIMONDS
ABRASIVE CO.





Everything from grains to grinding wheels

Everything from the most minutely screened abrasive grain to rugged giant sized grinding wheels. They're yours in Simonds Abrasive Company's complete line—manufactured under complete Simonds control for consistently dependable performance—backed by an engineering service to help you solve troublesome grinding problems—and supplied through a distributor set-up geared to meet every grinding need including rough snagging, precision finishing, metal polishing . . . for production operations and maintenance use.



Write for Grinding Wheel Data book, your handy guide on how to select and use Simonds Abrasive Company Grinding wheels.

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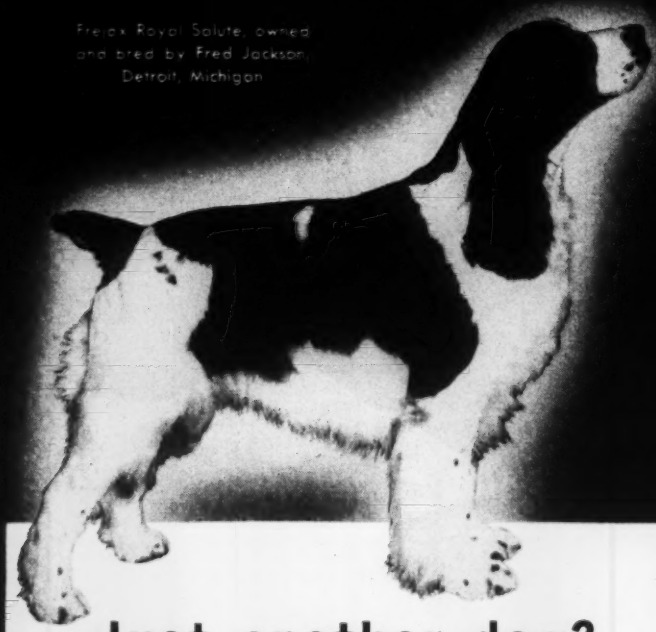


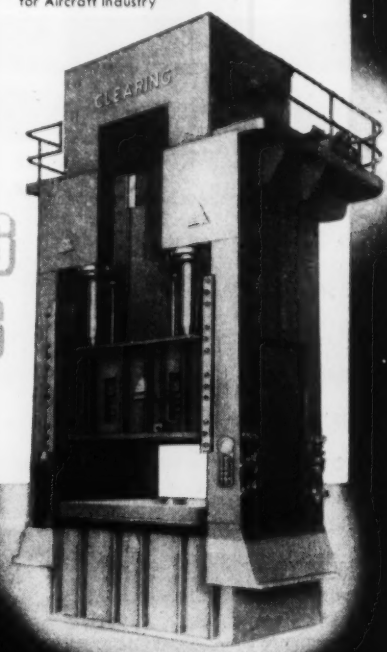
Just another dog?

To the casual observer he may look like just a neighbor's pet, but this is Frejax Royal Salute, holder of "Best in Show" in over forty dog shows. This outstanding achievement is the result of years of selective breeding.

Production men know that, while presses may look alike to the uninitiated, "breeding" pays here too. The years of practical Clearing experience combined with advanced engineering concepts make every Clearing press a thoroughbred. Clearing designs are never shackled to tradition, a fact which accounts for the performance records established by Clearing presses in such a wide variety of operations.

Before you invest in more equipment, have a Clearing representative explain how Clearing presses can save dollars and cents in your plant. Wire today to bring Clearing's fine engineering staff to bear on your problem, without obligation.

Heavy Double Action
Clearing Hydraulic Press
for Aircraft Industry



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back-chamfering, back-counterboring, recessing, thread and grinding reliefs, as well as other internal forming operations.

Threading Capacity Broadened

Normally equipped to cut right-hand threads of 12 to 32 pitch with collapsible taps or self-opening die heads, the standard 1-AC single spindle automatic offered by Warner & Swasey Co., Cleveland, is having its threading performance broadened by two new optional tooling arrangements. One provides for a 10 hp open-frame, intermediate slip, reversing-type main drive motor which allows solid taps of die heads to be used as well as the self-opening types.

This is a straight-forward method which involves no mechanical changes on the machine, the company reports, while maintaining tapping torque in proportion to the capacity of the main drive motor and spindle speed. A fixed trip on the machine's pentagonal selector drum actuates a limit switch ordinarily used to cut in a late cross slide, but which in the tapping cycle is used instead to reverse the motor. When the motor reverses, the tap feeds out of the work at the prescribed rate and the machine then is ready to cut back into rapid traverse reverse.

Second arrangement combines use of a reversing motor with a new feed and threading transmission incorporating two additional planetary shafts, so that a wider range of threads may be cut, either right or left hand. Leads of 0.1666 to 0.0132-inch (6 to 32 pitch) for left-hand threads are available, and in the right-hand range from 0.143 to 0.0312-inch (7 to 32 pitch), obtained by change gears. Eighteen feeds also are provided.

Term Denotes Metal Behavior

Rheotropic embrittlement, the phenomenon wherein the fracture behavior of certain metals is markedly modified by prior plastic flow, is a new term that has been added to metallurgical vocabularies. The nature of the condition has been under intensive study by Dr. W. M. Baldwin of Case Institute of Technology, Cleveland, and was introduced to the metallurgical world in a talk before the Pittsburgh Chapter of the American Society for Metals recently. The findings are expected to clarify some of the mysteries surrounding the fracture problem.

Where many metals show no serious loss of ductility as temperature is lowered, as strain rate is increased or as triaxial tensile stresses are introduced, some metals may show

abrupt losses of ductility under such changes of external conditions. According to Prof. Baldwin, it is in this class of metals that rheotropic embrittlement comes into play.

Up, Then Down—Most of the experiments he described involved prestraining tension bars at room temperature, followed by testing to fracture at liquid nitrogen temperature. As prestrain is increased, the ductility at the low temperature begins to increase, passing through a maximum and then decreasing to zero. Maximum ductility at the low temperature may be several times the ductility of material with no prestrain.

It was suggested that the initial embrittlement is brought about by some obstruction to slippage which is operative at low temperatures. Slip is confined to a few slip planes so that the capacity to slip is exhausted before a large overall deformation can occur.

If slip on a large number of planes is nucleated by straining at room temperature, the obstructive influence is overcome and many slip planes can participate in the deformation at the low temperature, the speaker reported. As still greater prestrains are used, the exhaustion of ductility under the prestraining conditions takes over and a normal linear decrease of remaining ductility with increasing prestrain is observed.

Tubing Boasts Toughness

Available as piping for oil and chemical processing applications is Glasweld, a glass-fiber material which is said to be impervious to extreme heat, chemical action and sledgehammer blows. A development of the United States Plywood Corp., New York, the material is a laminated tubing in which glass fibers, in the form of cloth, mat or tape, are bonded with resins to develop the final shape.

Initial uses have been in the structural and electrical fields, the company reports. Product also is said to possess good electrical properties, plus lightness in weight and a high strength factor. It reportedly has conquered corrosion from salt water and hydrogen sulphide, thus is expected to find use in line and well pipe.

New Temperature Pellet Types

For use in strongly reducing atmospheres at temperature levels where standard pellets may be influenced by gases present is a new line announced by Tempil Corp., New York. The problem of accurate

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You can depend on ARCOS electrodes for uniformity in results from pound after pound. Specialized quality control is responsible for consistently high performance. All standard grades and sizes available from distributor stocks.

SEND FOR THIS APPLICATION CHART showing types available, popular names, applications, specifications, types of coatings and color identification.

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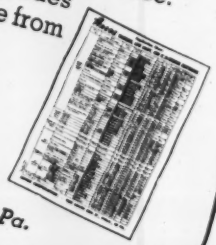

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Specialists in Stainless, Low Alloy and Non-Ferrous Electrodes

temperature indication in such media as hydrogen, cracked ammonia and producer gas can now be solved, it is said.

Supplementing this new material is the addition to the standard pellet series to include the temperature range from 2000 to 2500° F in 50° intervals. The range of Tempilac, liquid temperature indicator, has also been extended to include temperatures from 1600 to 1950° F.

Close Tolerance Boring

By pushing engine blocks into the fixture, pressing the start cycle button and then removing the blocks at the completion of the cycle, the operator of the line boring machine made by Ex-Cell-O Corp., Detroit, simultaneously bores to close tolerances crankshaft and camshaft bearings in an automatic cycle. With those simple steps, the net production is from 25 to 35 blocks per hour, depending on the particular job.

It is reported that in some instances it has been found advantageous to incorporate other precision boring operations in this machine, thereby keeping additional bores in accurate relationship to the crankshaft and camshaft bores. Dowel holes in the transmission end of the block and distributor shaft holes are sometimes drilled at the same time on the same machine.

3 Fittings Make Scaffolds

With three patented fittings and standard pipe, scaffolds can be readily built to any length, depth, height or shape desired. Horizontal units can be placed at any desired working level and vertical ones can be placed between obstructions.

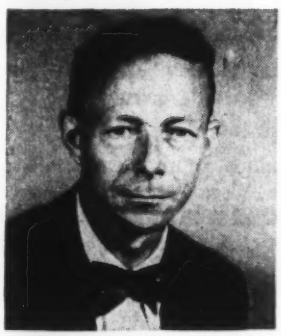
Secret of this scaffolding system is fittings made by Amidon Sales Co., Elyria, O. They are of three types: Three-way, for connecting longitudinal, transverse and vertical pipes into a single corner joint; two-way for fastening two pipes at right angles; and sleeve, for joining lengths of pipe and attaching casters.

X-Ray Gage Changed in 5 Seconds

Five seconds is all the time required to change the thickness setting of Measuray x-ray gages, made by Sheffield Corp., Dayton, O., for non-contact continuous or intermittent thickness measuring of moving or stationary hot or cold metal strip and nonmetallic sheet.

Said to eliminate the need for masters, the gages include a small scanning unit containing an x-ray tube

THIS BELT KICKS OUT FOUNDRY GATES



Here is Mr. Eugene Brown, NYB&P Distributor, who has a customer whose conveyor belt was being torn and gouged by razor-sharp foundry gates.

Mr. Brown* solved the problem by specifying the NYB&P belt shown above, for this shake-out service. Within the structure of this belt, special segments have been built that kick out destructive gates before they get a chance to do serious damage. It has a tough, heat-resistant cover and is flexible enough to trough easily, thereby allowing for maximum loads.

It saves users considerable time and money by giving greater trouble-free service than any comparable belt of conventional construction. These are some of the reasons why its owner, like so many other NYB&P users, refused to order any other brand.

Whenever you have a problem involving mechanical rubber goods, consult your NYB&P Distributor. Rely on his help and practical advice. His reputation has been built on his ability to keep production lines moving and to supply you with the right item at the right time.

**Brown Engineering Co., Reading, Pennsylvania.*

NEW YORK BELTING & PACKING COMPANY
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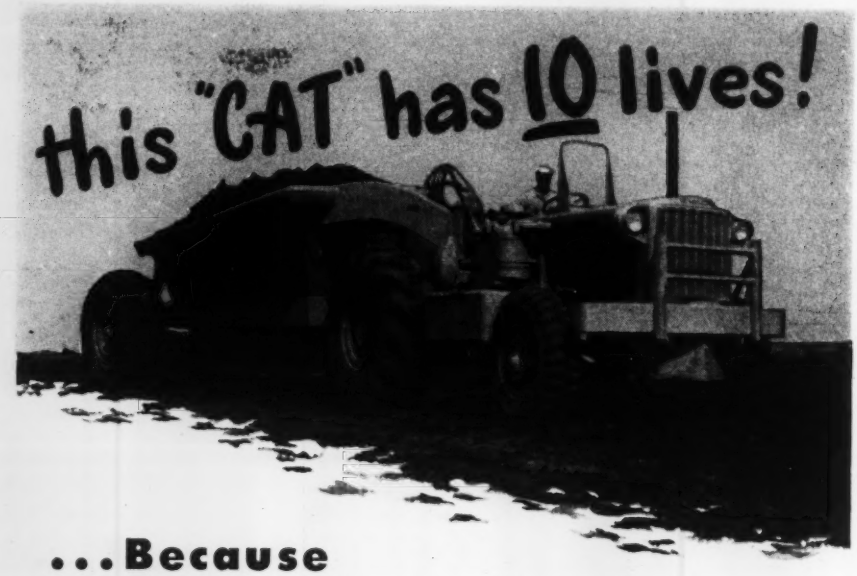
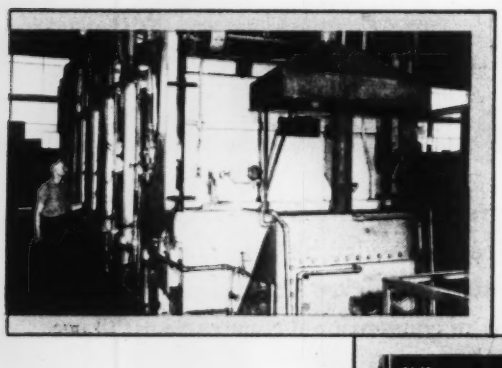


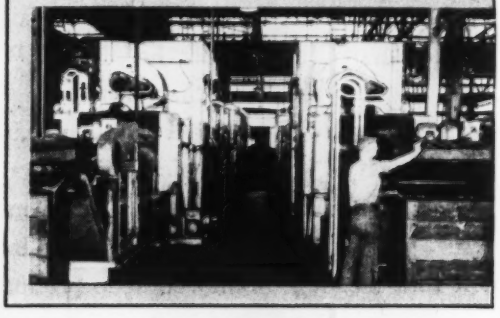
...Because critical parts are heat treated in HOLCROFT furnaces

Caterpillar Tractor Co.—producer of rugged, long-lasting earthmovers—adds another life to the cat's proverbial nine! This new model will last longer because certain critical parts are hardened and drawn in Holcroft furnaces. Result: extra stamina for the product and lower costs for the owner. Plant savings are possible because of high production, fast operations and fewer rejects.



This is the discharge end of one of two Holcroft hardening furnaces in the "Caterpillar" plant. It is radiant-tube-fired, completely conveyorized, and has a capacity of 3000 lbs. per hour.

This is the unloading end of the twin draw furnaces. They are also conveyorized, using alloy roller chains. The furnace is heated by gas-fired recirculating heaters.



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CANADA — Walker Metal Products, Ltd., Windsor, Ontario
EUROPE — S. O. F. I. M., Paris 8, France

mounted inside its own transformer, simplified power cabinet with all units easily accessible for maintenance, no exterior high voltage cables, and simplified remote control station containing all operating and calibrating controls. Several models are available for measuring foil as thin as 0.0005-inch in thickness and hot steel strip up to 0.420-inch thick. Models are available for tin plate and intermediate thickness of all metals.

Farm Welding Awards Set Up

Opportunity for national recognition and a chance to win a cash award has been established for high school students studying vocational agriculture. The program is a $7000 arc welding award conducted by James F. Lincoln Arc Welding Foundation, Cleveland. Formulated by teachers from over 30 states, the awards will be given for the best descriptions written by high school students of how arc welding was or could be used on a farm project.

Printer for Small Company

Designed for small businesses and industrial offices is a new model Whiteprinter offered by Charles Bruning Co. Inc., New York. Capable of making copies up to 11 inches wide and at a speed from 0 up to 24 feet per minute, the unit is mobile and requires no installation except plugging into an electrical outlet. Features incorporated include stepless variable feed transmission which is said to give instantaneous and accurate speed setting and vibrationless action. It includes a built in two-roll developer for film masters.

Trapped, So It Comes Clean

Extending commutator and brush life is an Airsan air filter which traps all atmospheric and processed dust for Louis Allis blower-cooled, electronically controlled direct current motors. A development of Air Filter Corp., Milwaukee, Wis., the filter is said to assure clean motor and minimize motor maintenance.

Aluminum ABC is A to Z

The ABC of aluminum alloys, benefits, and consumption are the three parts of a nontechnical book, telling the complete story of aluminum. Published by Reynolds Metals Co., Louisville, Ky., the book tells how the magic of chemistry and electricity turn clay into the bright metal products made of the metal.

Called *The ABC's of Aluminum*, it features a series of 69 pictures and

charts, arranged in sequence to present a pictorial story showing the production of aluminum from raw ore, then how it is made into metallic aluminum and subsequently processed to form sheet, rod, bar, and other mill products.

Radiography Papers Published

To correlate recent developments in radiography, the papers and discussions of a session on radiography at the 52nd annual meeting of the American Society for Testing Materials in Atlantic City, N. J., in 1949, have now been published by American Society for Testing Materials, Philadelphia.

In his introduction Leslie W. Ball says: "There has been a fascinating surge forward in two other aspects of this still young and vital technology. These rapidly developing aspects are in the engineering of radically new equipment and in the skilled exploitation of nondestructive testing in the management of engineering and material-processing development projects."

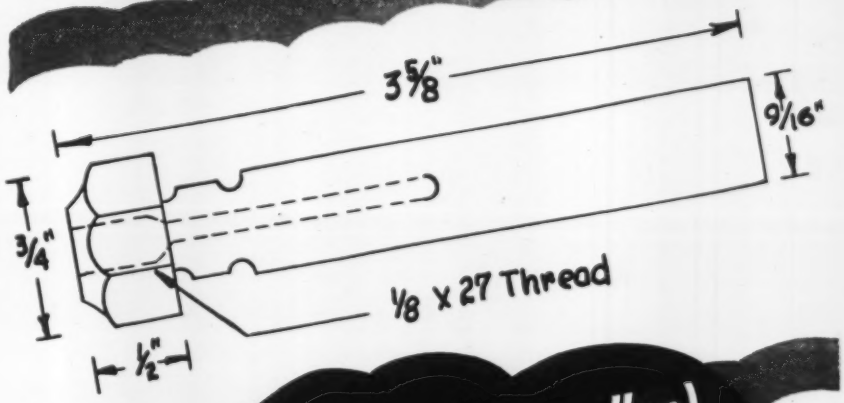
The compilation contains the following papers: Recent Progress in Flash Radiography; 10 Meg X-ray Technique; Radiography and Autoradiography by Photoelectrons; Mobilizing the Van de Graaff Generator for Precision Radiography; A Universal Exposure Calculator for Radium Radiography and Its Application to Current Radiographic Films and Techniques; A Discussion of Radiographic Sensitivity; A Revised Procedure for Establishing Radiographic Standards; An Investigation of Radiography in the Range from 0.5 to 2.5 Million Volts. Copies of the 100-page illustrated publication can be obtained from the ASTM, 1916 Race Street, Philadelphia 3, Pa., for $1.75.

Special Purpose but Adaptable

Built for a special purpose—drilling and chamfering a 36-inch steel ring 3¼ inches thick, but readily adaptable to other similar operations, is machine announced by Snyder Tool & Engineering Co., Detroit. It has a capacity of 1.6 pieces an hour at 80 per cent efficiency, and is equipped with control mechanism which provides for alternating the depths of the 36 holes drilled and chamfered around the circumference of the work piece.

The vertical head also drills three groups of holes in the top of the part. This head is cycled automatically when the workpiece is located in the proper radial position. Indexing is automatic by means of a 34-inch diameter table with Geneva index.

How to trade *Pennies* for *Dollars* . . .



10c more (per gallon) invested in cutting fluids SAVES $50 PER DAY PER MACHINE!

PRICE alone makes no profit. The drawing above illustrates a shackle bolt which is drilled and tapped on a New Britain Automatic. Using an inferior cutting oil 12 taps were used up every 2½ days—12 pieces per tap. A change to Stuart's SPEEDKUT M on a 2½ day run showed 530 pieces per tap—no taps used up. The saving? Taking into full account the pennies-higher price of Stuart *quality* oil: $50 per day per machine!

If you are interested in a saving like this, ask to have a Stuart representative call. There is no obligation—we'll let Stuart performance do the selling.

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Send for your copy of **"CUTTING FLUID FACTS,"** *Stuart's booklet of cutting fluid data.*

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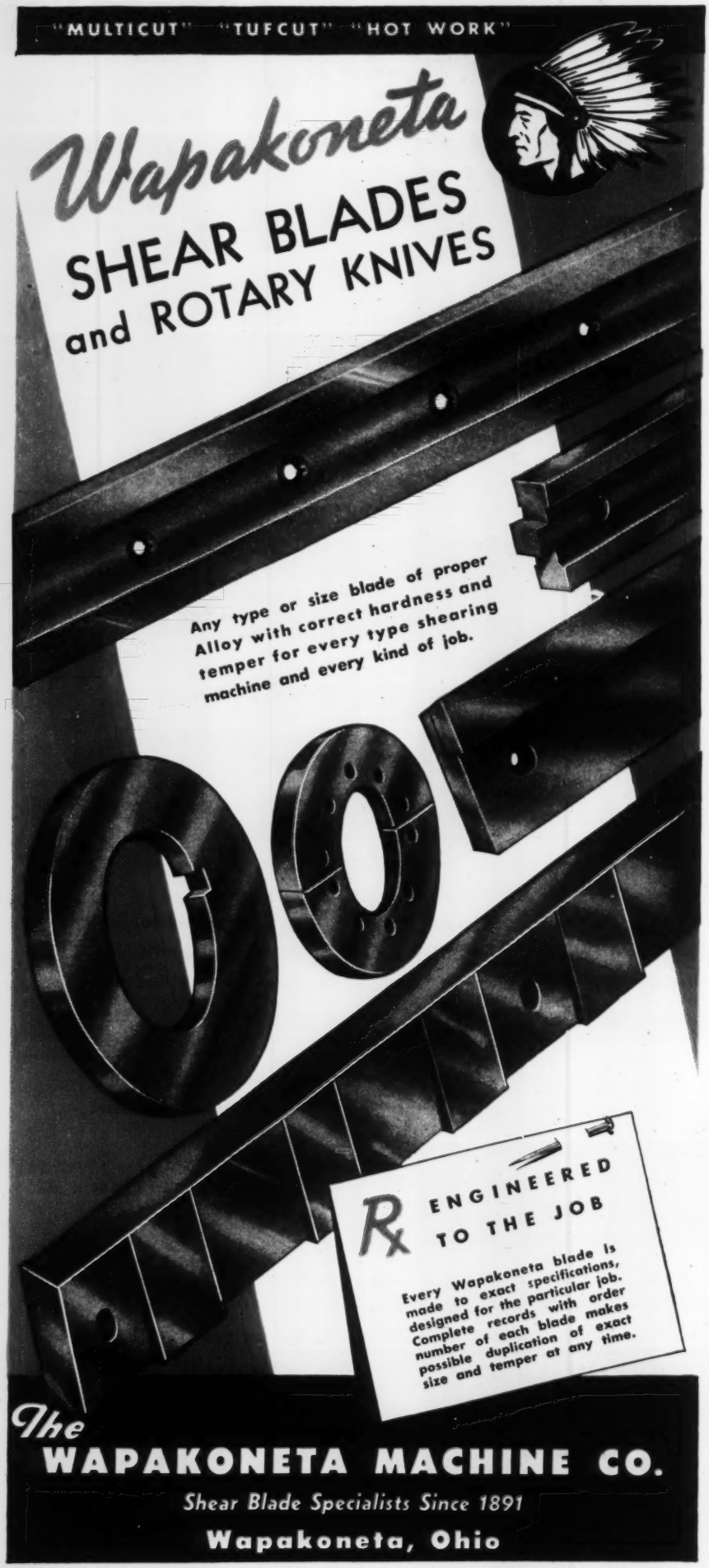
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Clamping is manual but the work cycle is automatic thereafter.

Tools are 1 5/16-inch high speed steel, working at 116 rpm with infeed of 0.016-inch per revolution. The vertical, 11-spindle head is powered by a 20 hp motor. Stroke is 16 inches. The work cycle of load, rapid advance, drill, chamfer, rapid return and index is repeated until all radial holes are drilled.

Dynatork Application Expanded

In continuing its policy of offering the Dynatork drive on all models of fork-lift trucks, the Industrial Truck Division, Clark Equipment Co., Battle Creek, Mich., is announcing that it is optional equipment on its Yardlift-60, pneumatic-tired fork truck of 6000-pound lift capacity.

The drive transmits engine power to the drive axle by magnetic induction, across an air gap. Standard transmission is replaced by forward-and-reverse constant-mesh gearing. Visible differences between the two models are the directional control switch mounted on the steering column, use of only one gear shift lever, and inching control pedal, rather than the conventional-clutch pedal, and location of the gas tank on the left running board.

The directional control switch is manipulated by a finger-tip lever. It has three positions—forward, reverse and neutral—which may be changed from forward to reverse, or the opposite, while the machine is moving without fear of damage to the mechanism. A "dead-man" control, standard equipment, is operated by the driver's seat.

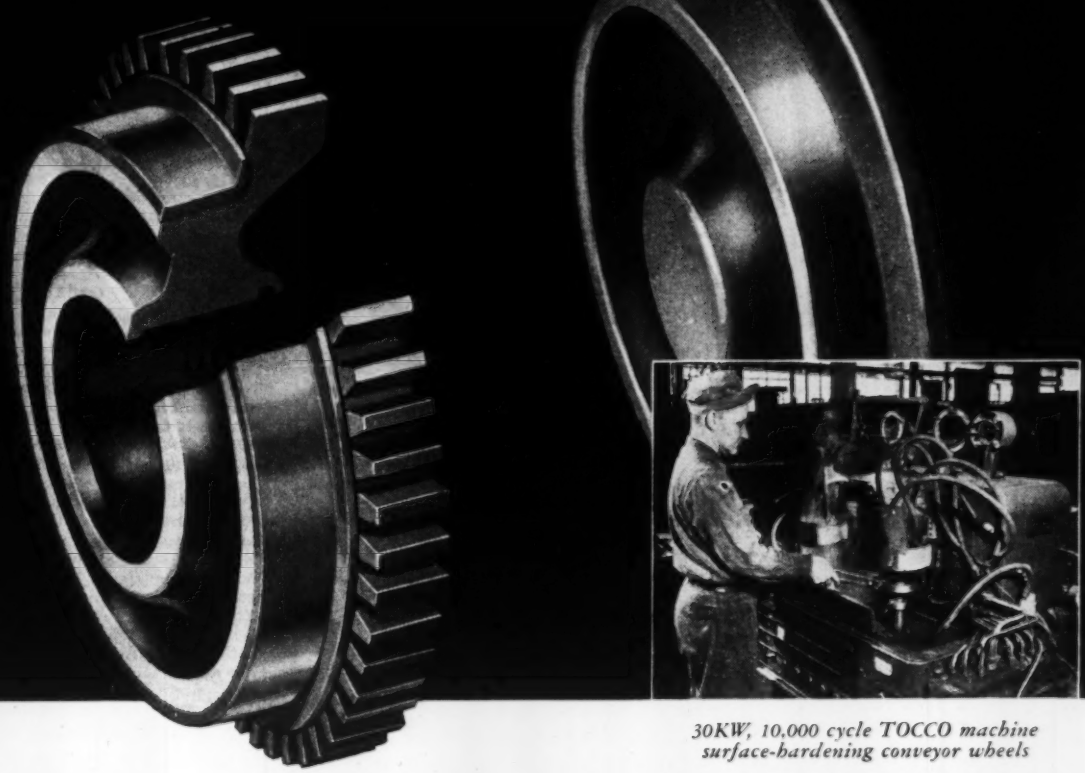
Anodes Prevent Corrosion

If you are being plagued with underground corrosion of metal pipes, tanks, and other structures caused by galvanic action between adjacent areas of the same or different metals, Federated Metals Division, American Smelting & Refining Co., New York, wants to help you. It has published a folder which describes the causes of underground corrosion and a simple way to long-term protection by the use of magnesium anodes.

Such corrosion is not necessarily due to inherent weakness in the metal itself, but is due to chemical action between various areas of the metal and the chemicals in the soil which in effect result in the formation of numerous tiny batteries. Protection of underground installations against this reaction is afforded by magnesium anodes which are consumed in lieu of the anodic metal in the structure.

Ups output 250%

...STOPS REJECTS



30KW, 10,000 cycle TOCCO machine surface-hardening conveyor wheels

with TOCCO* Induction Heating

PROBLEM: Cleveland Crane and Engineering Co. hardens the *running surface* of steel drive wheels and idlers used in their tramrail overhead materials handling equipment. Flame-hardening limited their production to only 300 wheels per day—rejects ran as high as 55%!

SOLUTION: A 30KW, 10,000 cycle TOCCO machine to provide speedy automatic heating.

RESULT: Production increased 250%—costly rejects eliminated, a completely automatic "virtually foolproof" operation. The TOCCO machine, in use for two years, has required no maintenance other than regular lubrication!

Like to duplicate this success story? Why not have a TOCCO engineer survey your hardening, brazing, forging or melting requirements for similar cost-cutting results?

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818 Olive Street, St. Louis 1, Missouri

CALENDAR OF MEETINGS

† *Denotes first listing in this column.*

Nov. 8-11, Manufacturers of Mechanite Castings: Annual convention, Hotel Knickerbocker, Chicago. Sponsored by Mechanite Metal Corp., New Rochelle, N. Y.

Nov. 9-10, Society of Automotive Engineers: Fuels and lubricants meeting, the Mayo, Tulsa, Okla. Society headquarters are at 29 W. 39th St., New York 18.

†**Nov. 9-10, Magnesium Association:** Sixth annual meeting, Biltmore Hotel, New York. Association is located at 122 E. 42nd St., New York 17.

Nov. 10, American Iron & Steel Institute: Regional technical meeting, Mark Hopkins Hotel, San Francisco. AISI is located at 350 Fifth Ave., New York 1.

Nov. 12-15, National Automatic Merchandising Association: Annual convention and exhibit, Palmer House, Chicago. Association offices: 7 S. Dearborn St., Chicago 3.

†**Nov. 14-16, American Institute of Electrical Engineers:** Machine tool conference, Sheraton Hotel, Worcester, Mass. AIEE address: 33 W. 39th St., New York 18.

† **Nov. 15, National Welding Supply Association:** West central zone meeting, Hotel Kirkwood, Des Moines, Iowa. Association address is 505 Arch St., Philadelphia 6.

†**Nov. 16-17, American Zinc Institute:** Galvanizers committee meeting, Tutwiler Hotel, Birmingham, Ala. Address of institute is 60 E. 42nd St., New York 17.

Nov. 17, Illinois Mining Institute: 58th annual meeting, Hotel Abraham Lincoln, Springfield, Ill. Institute is located at 28 E. Jackson Blvd., Chicago 4.

†**Nov. 27-29, American Standards Association:** National standardization conference, Waldorf-Astoria Hotel, New York. Association may be reached at 70 E. 45th St., New York 17.

Nov. 27-Dec. 2, American Society of Mechanical Engineers: 19th National Exposition of Power and Mechanical Engineering and annual meeting, Grand Central Palace, New York. Exposition headquarters: Grand Central Palace, New York 17.

Dec. 1, American Iron & Steel Institute, regional technical meeting Drake Hotel, Chicago. AISI headquarters: 350 Fifth Ave., New York 1.

† **Dec. 4-6, Electric Industrial Truck Association:** Meeting, Hotel McAlpin, New York. EITA is located at 3701 N. Broad St., Philadelphia.

† **Dec. 5, National Welding Supply Association:** Southeastern zone meeting, Hotel Patten, Chattanooga, Tenn. (Note next meeting)

† **Dec. 7, National Welding Supply Association:** Southeastern zone meeting, Hotel Texas, Fort Worth, Tex. Address of association is 505 Arch St., Philadelphia 6.

Dec. 7-9, Electric Furnace Steel Committee, AIME: 8th annual meeting William Penn Hotel, Pittsburgh. AIME headquarters: 29 W. 39th St., New York 18.

†**Dec. 13-14, Power Crane and Shovel Association:** Meeting, Edgewater Beach Hotel, Chicago. Association address is 74 Trinity Place, New York 6.

†**Dec. 14, Cutting Tool Manufacturers Association:** Meeting, Recess Club, Detroit. 416 Penobscot Bldg., Detroit 26, is association address.

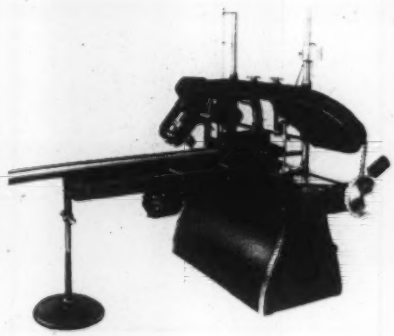
Stainless Reduces Weight

Using stainless steel for liquid chemical extinguishers because it increases strength and pressure resistance, Walter Kidde & Co. Inc., Belleville, N. J., is making 2½-gallon portable fire extinguishers for water, soda and acid, and foam from the material.

New Products and Equipment

Makes Metal Cutting Easier

Many hand operations have been eliminated in an effort to decrease fatigue on the model D 14-inch metal cutting band saw introduced by W. F. Wells & Sons, Three Rivers, Mich. It can be set to automatically raise itself at the completion of a cut and



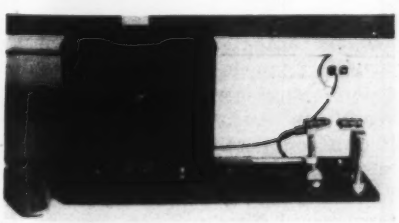
start down again without stopping the blade. When equipped with an automatic vise tightener the operator merely feeds the stock. Incorporation of a bar feed will eliminate an operator.

Maximum clearance under saw blade is 20 inches and capacity is 14 x 18 inches. The vise will swivel 45 degrees in either direction. Cutting head is of one-piece welded construction and includes beams for blade guides and column housings, assuring alignment and totally enclosing the blade. A rotating blade brush cleans chips from between the teeth as well as from the sides.

Check No. 1 on Reply Card for more Details

Production Soldering Tool

For various types of soft soldering and silver brazing operations and adapted to sweating operations and terminal connections is a solenoid operated resistance type soldering tool



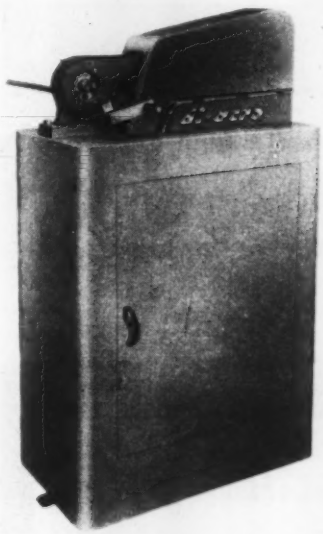
developed by Luma Electric Equipment Co., P. O. Box 132, Toledo 1, O. Electrodes are controlled by a foot switch. Unit illustrated is a 2500-watt tool equipped with selector switch that gives instant temperature control at six different settings. Others can be furnished with one or ten stages of heat control.

Uniform work is assured as all units are equipped with a time clock for control of the time cycle per connection. Soldering contacts are graphite blocks and may be shaped to fit the application. Operation of the unit may be continuous.

Check No. 2 on Reply Card for more Details

Cuts Without Distortion

Accurate cutting or parting off of rods and bars without distorting their roundness or crushing the material is possible with the Di-Acro power parter made by O'Neil-Irwin Mfg. Co., Lake City, Minn. Machine is



equipped with an air cylinder, cushioned at both ends for quiet and efficient operation.

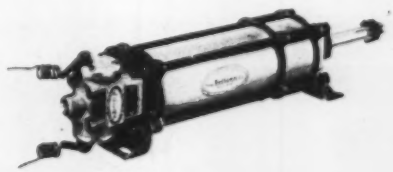
Each cutting cycle is obtained through a four-way foot valve. Range is from very small rods to $\frac{5}{8}$-inch diameter bars. Square, rectangular, hexagon, and other shapes can be cut. The Ejectomatic gage feature allows three separate operations of gaging, parting and ejecting to be obtained in a single working cycle.

Check No. 3 on Reply Card for more Details

High Speed Air Motors

Suited to a wide range of staking, riveting, forming, swedging, stamping and punching operations is the model BSSM series of super speed air motors offered by Bellows Co., 222 W. Market St., Akron, O. Double-acting air cylinder of the unit develops high piston rod speed and power from normal operating air pressure. A built-in air accumulator and quick release valve build up force more powerful than that obtained from conventional air motors.

Model BSSM-5 motor at 100 pound air pressure develops a force sufficiently great to punch a $\frac{1}{2}$-inch diameter hole through 1/16-inch thick mild steel. Other operations for which it may be adapted include quick cutting of continuously moving material and flash trimming of molded



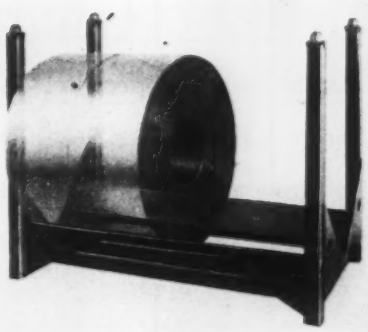
or cast parts. Motors are made in bore sizes of $2\frac{1}{2}$ and $3\frac{5}{8}$ inches and are equipped with either manually operated valves or Bellows Electro-aire valves. Standard stroke lengths are 4, 6, 9 and 12 inches in both sizes. Special stroke lengths are available.

Check No. 4 on Reply Card for more Details

Heavy Duty Coil Rack

Up to 10,000 pounds may be supported by heavy duty coil racks made by American Metal Products Co. and distributed by American Sales Engineers, 141 W. Eight Mile Rd., Detroit 3, Mich. Racks are of tubular all-welded construction with two heavy square tubes welded together for extra load capacity.

Nesting caps, welded into the tubular corner posts make possible stor-



age in multiple tiers. Racks are so designed that the entire weight of the upper tiers is carried by the corner posts in the lower tiers, with no stress on materials stored. Racks may be moved by crane or truck from receiving through storage and

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continuous feeding of automatics

FOLLANSBEE POLISHED BLUE STRIP can be fed directly into automatics—a continuous, time-saving supply system for any kind of metal-forming operation.

from coils of polished blue strip

FOLLANSBEE POLISHED BLUE has a high-gloss, intense blue finish which is the distinguishing characteristic of this superior strip, and a sales feature for any product in which it is used.

sets a fast production pace

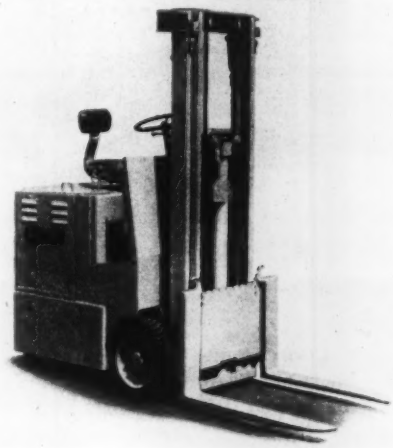
FOLLANSBEE POLISHED BLUE STRIP is furnished in continuous coils for productioneering with automatic machines. There's a Follansbee Steel Representative nearby who can tell you more about Follansbee Specialty Steels.

production lines. Where standard sizes do not meet requirements, special designs may be made.

Check No. 5 on Reply Card for more Details

Fork Truck Tiers to 130 Inches

Possessing a short turning radius of 60 inches is the model 230 Jeep fork truck built by Mercury Mfg. Co., 4140 S. Halsted St., Chicago 9, Ill. Maximum fork elevation of 130 inches is attained by a single cylinder low pressure hydraulic lift with cross suspension. Truck height is a stand-



ard 83 inches. Length including the 36-inch forks is 95½ inches and width is 36 inches.

Features include inclined automotive steering, foot pedal acceleration, convenient hoist and tilt controls and good visibility. Cushion type tires, shockless center point steering, magnetic contractor travel controls and unit power plant with double reduction gearing are incorporated. Various safety features have been built into the truck.

Check No. 6 on Reply Card for more Details

Firing Cycle Reversal System

Savings in fuel, longer checker life, increased steel production, greater freedom on the part of the operator and greater operational flexibility are advantages accruing from the use of a time cycle reversal system for automatic control of open-hearth furnace firing, offered by Bloom Engineering Co. Inc., 857 W. North Ave., Pittsburgh 12, Pa. It is a completely prewired, self-contained unit that standardizes the reversal systems on all open-hearth furnaces. Reversal is completed smoothly and quickly; when the firing period is completed, the furnace is again reversed.

All reversal operations are performed in proper sequence on a predetermined time cycle and without operator attention. Timing may be

HERE ARE 4 TYPICAL APPLICATIONS

All the production short cuts shown on this page have been supplied by plant engineers, electricians and tool designers who have found MICRO precision switches ideal in making present plant equipment more automatic, safer and more convenient to operate.

There are hundreds of such applications in MICRO SWITCH files. Plant production men are invited to send for a file of MICRO TIPS, a publication devoted to these practical, time-saving ideas. Better still, let us put you on our list to receive MICRO TIPS regularly.

MICRO

Precision Switches for PRODUCTION SHORT CUTS

MICRO SWITCH distributors with complete stocks are located in over one hundred cities to supply you with just the right switch to make your plant operations more automatic. Look for them under "Switches, Electric" in your classified phone book.

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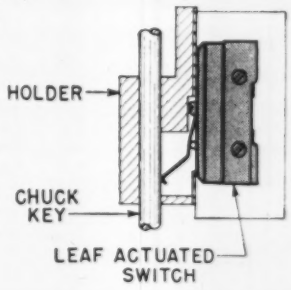
FREEPORT, ILLINOIS, U. S. A.

Copr. 1950, Minneapolis-Honeywell Regulator Co.

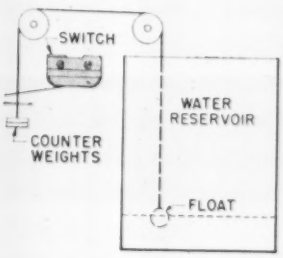
Branch Offices in Principal Cities of the United States and Canada

❶ MICRO precision switch insures safe drill press operation.

This drill press cannot start until the chuck key is removed. A normally-open snap-action switch in a special holder with mounting plate is attached to the column of the drill press. With the switch wired into the motor starting circuit, the press cannot be started until the chuck key is removed from the chuck and is inserted in the holder.



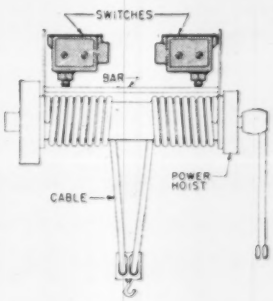
❷ MICRO precision switch signals when reservoir water is too low.



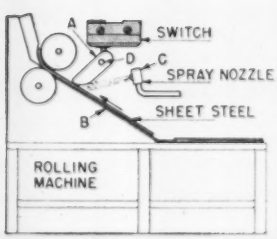
Low water level in a large concrete water reservoir is indicated by a snap-action switch with a leaf type actuator. When the float drops to the predetermined level, counter weights actuate the switch. In such an application the switch can either be used to operate a signal light or be wired into the motor starting circuit to start the pump.

❸ MICRO precision switches stop power hoist should cable become overlapped.

Should this hoist be raised too high and cable overlap, these two snap-action switches are wired into the motor circuit to stop the hoist and to ring an alarm bell. Their use in the application protects against breakage of the hoist or the cable with possible damage to the load.



❹ MICRO precision switch operates oil spray as sheets enter forming rolls.



This snap-action switch is used to operate the spray gun which sprays soluble oil on steel sheets just before the sheets enter the forming rolls. Thickness of the sheets on the conveyor operate the switch through actuator "A", which is pivoted at "D". Spray gun is thus operated only for the period desired and disconnected as the sheet passes on into the rolling machine.

MICRO . . . first name in precision switches

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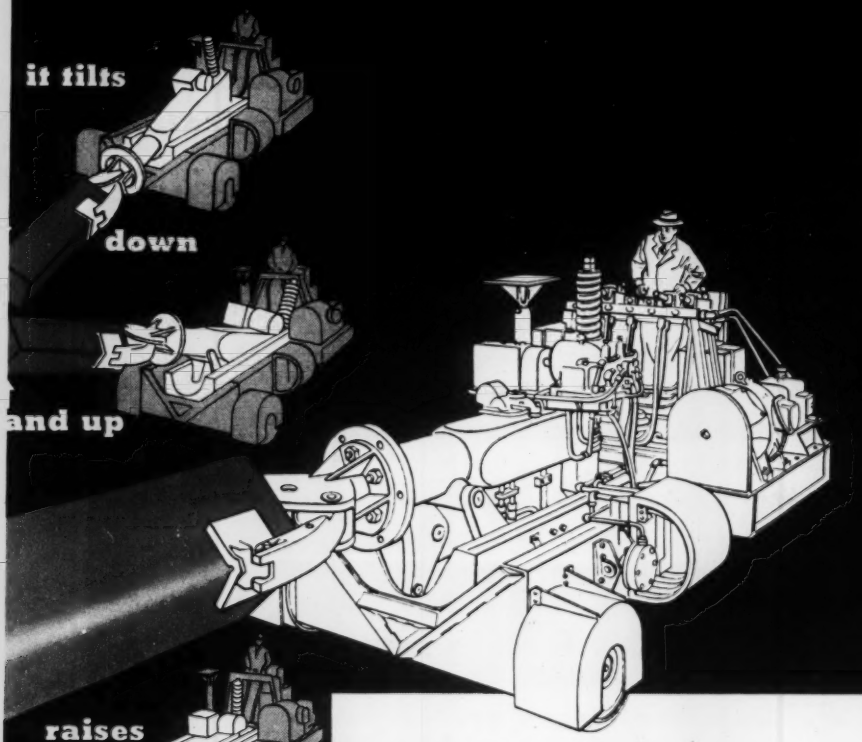
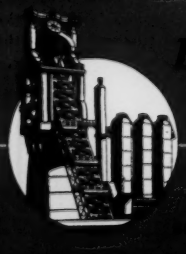
agile*



✳ Amazingly enough, you'll find *agile* an apt description of the massive Brosius Auto Floor Manipulator at work on your forging floor. With swift agility it draws or charges — turns on a dime and moves with independent facility — manipulates the billet or blank with remarkably sensitive movements. And each unit possesses the inherent sturdiness and sensible simplicity so typical of Brosius products. Brosius manipulators will bring to your forge shop added speed, added safety, added economy — you should be using them. Write for literature.



Edgar E. BROSIUS Co.

changed or reverted to manual operation by control button at any time. System is designed to facilitate installation as well as operation.

Check No. 7 on Reply Card for more Details

Desk Mounted Metallograph

All controls and adjustments of the improved metallograph announced by American Optical Co., Buffalo, N. Y., are within easy reach of the operator. Directly in front of him are the 5 x 7-inch camera, monocular or binocular microscope eyepieces and ball-bearing mechanical stage. Within reach is electrical control panel for arc and visual lamps. Four objectives on rotating turret, photographic eyepieces mounted on a quick-change slide, camera shutter and color filters are operable from a sitting position.

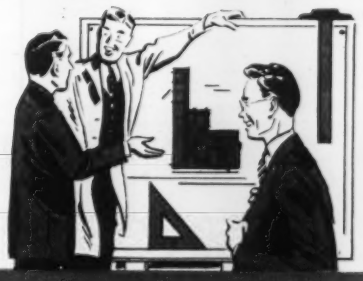
Optical systems for photography and visual observation are coupled to permit all focusing to be done through the visual system. Grain size measurements, ferrous or non-ferrous, are compared directly on ground glass with standard charts. Case depth and linear measurements made with an accessory micrometer rule. Selection of magnification is rapid. Standard ASTM magnifications range from 50 to 1500X, with 2000X available on special request. Desk has linoleum top and storage space for accessories and supplies.

Check No. 8 on Reply Card for more Details

Grinding Guesswork Eliminated

Dispensing with the necessity of checking and rechecking tool angles during grinding and lapping is the Agathon type 175A tool grinding and lapping machine offered by Hauser Machine Tool Corp., 30 Park Ave., Manhasset, N. Y. Tool is held in a compound holder which slides on a bar parallel to the wheel spindle so that after grinding each surface of

Designed for



Continuous Operation

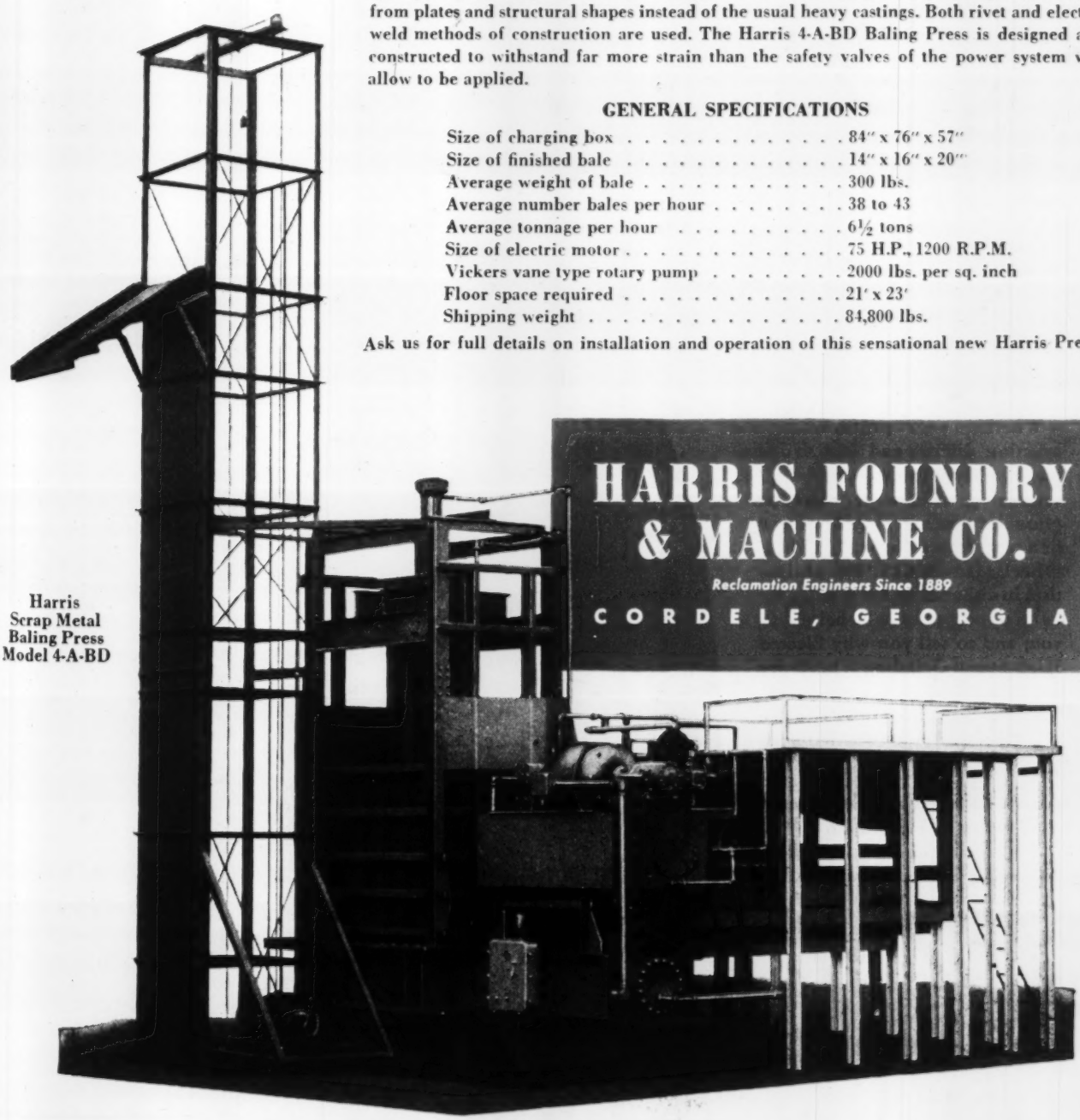
THE NEW HARRIS PRESS

BOTTOM DROP-OUT FOR BALES SPEEDS PRODUCTION—This revolutionary design is a great time saver and profit maker. While the compression chamber is baling, the charging chamber is receiving a new load. No bale is too large to come out of the new, speedy, bottom drop-out. This new Harris Press is of exceptionally sturdy construction from plates and structural shapes instead of the usual heavy castings. Both rivet and electric weld methods of construction are used. The Harris 4-A-BD Baling Press is designed and constructed to withstand far more strain than the safety valves of the power system will allow to be applied.

GENERAL SPECIFICATIONS

Size of charging box	84" x 76" x 57"
Size of finished bale	14" x 16" x 20"'
Average weight of bale	300 lbs.
Average number bales per hour	38 to 43
Average tonnage per hour	6½ tons
Size of electric motor	75 H.P., 1200 R.P.M.
Vickers vane type rotary pump	2000 lbs. per sq. inch
Floor space required	21' x 23'
Shipping weight	84,800 lbs.

Ask us for full details on installation and operation of this sensational new Harris Press.



Harris
Scrap Metal
Baling Press
Model 4-A-BD

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OR WHAT?

Just by telling us that you have roll wheel grinding problems, you can get job-side help quick from an Electro Technically Trained Field Engineer.

He will bring you the benefit of our long experience with wheels for grinding hot mill rolls of Hardened Steel, Cast Iron and Chilled Iron.

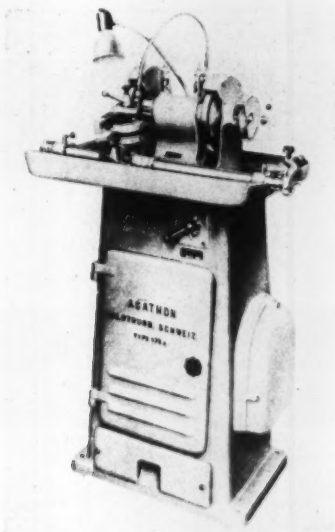
Whether your problem is this exacting, difficult and ticklish operation in cylindrical grinding, or something else, write, wire or phone us to send a Field Engineer or a copy of our Electro Grinding Wheel Manual 645. No obligation in either case, but it will give us an opportunity to be helpful to you; and to tell you why Electro High-Speed Grinding Wheels are engineered to specific jobs. Wheel performance on trial orders is the big reason for our steady, sizeable growth.

Electro Refractories & Alloys Corp.
344 Delaware Ave., Buffalo 2, N. Y.
West Coast Warehouse, Los Angeles
Canadian Electric Furnace Plant, P. Q.

Electro HIGH-SPEED
RESIN BONDED GRINDING WHEELS

the tool it is only necessary to move the holder to the lapping wheel for a final finishing job.

Tools with a cross section as small as 1.57 x 2.36 inches can be ground and lapped with accuracy. Flexible coolant nozzle directs a stream to the spot desired. Provision is made



for grinding chip breakers and curlers. Special attachments allow accurate grinding and lapping of cutter heads, engraving tools, round boring tools and other special tools.

Check No. 9 on Reply Card for more Details

Continuously Removes Chips

Manufacture of a conveyor unit which continuously moves metal chips, borings, or tunings from operating automatic or multiple spindle production machines is announced by

May-Fran Engineering Inc., 1725 Clarkstone Rd., Cleveland 12, O. The Chip-Tote conveyors, incorporating hinged steel conveyor belting, will handle hot, heavy, wet or dry chips. Models will be made available to meet height and width requirements of all metal removing machine tools.

Chips are funneled into conveyor

Call STERLING BOLT FOR Machine Bolts

all sizes

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Square Head

Steel or

Brass

...and for all other metal fastening needs

Whether you need machine bolts or any of the hundreds of other items in our full line of metal fastenings, the quickest, easiest, most efficient way for you to fill your requirements is to call Sterling Bolt. • It is to your advantage to use "Sterling Bolt One-Source Service" by listing *all your metal fastening needs* on one order. The benefits of One-Source Service are cumulative—convenience and efficiency in ordering, savings resulting from reduction in personnel time and paper work, and security in the knowledge that the right fastenings will be delivered to the right place at the right time. Whatever your metal fastening needs . . .

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belt by means of a steel hopper, carried horizontally until clear of the machine's operating mechanism, and then transported up an incline for discharge into tote boxes or onto a carry-off conveyor system. Belt design prevents fall-through of chips. Coolant is not removed. Wiper blades at intervals prevent jamming.

Check No. 10 on Reply Card for more Details

For Short and Long Run Turning

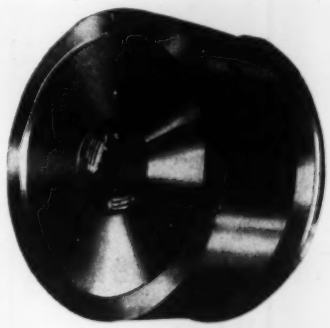
Sundstrand Machine Tool Co., Rockford, Ill., is announcing its model 8A automatic lathe adaptable to a variety of turning operations on parts with a maximum swing (over cross slide) up to 12½ inches in diameter. Heavy precision bearing spindle, 25 hp spindle, high rapid traverse rate and automatic cycling make it possible to use multiple tooling and carbide tools. Same production advantages can be applied to short run work because of the quick cycle changeover feature.

Two ranges of spindle speeds are available, from 40 to 1200 rpm and from 80 to 2400 rpm. It is possible to get four speed changes with one set of two "pick-off" change gears. The wide range of cycles can be obtained from either of the two types of front carriage units which may be furnished. Standard carriage unit provides angular feed-in, tool relief, slow-up and dwell. Optional type provides straight feed-in, tool relief, slow-up and dwell.

Check No. 11 on Reply Card for more Details

Chuck Has Cam Gripping Action

Scroll type universal adjustment for pipe size is provided by the air-operated power chuck introduced by Bignall & Keeler Division, John Ramming Machine Co., 4591 McRee Ave., St. Louis 10, Mo. A universal cam-



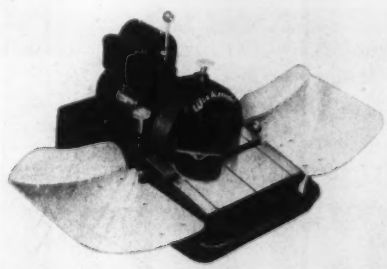
operated gripping action is used. Chuck can be operated without stopping the machine arbor.

Operation is on a small quantity of low pressure air. Self-contained, with an integral air cylinder, the chuck may be used on pipe threading machines made by the company.

Check No. 12 on Reply Card for more Details

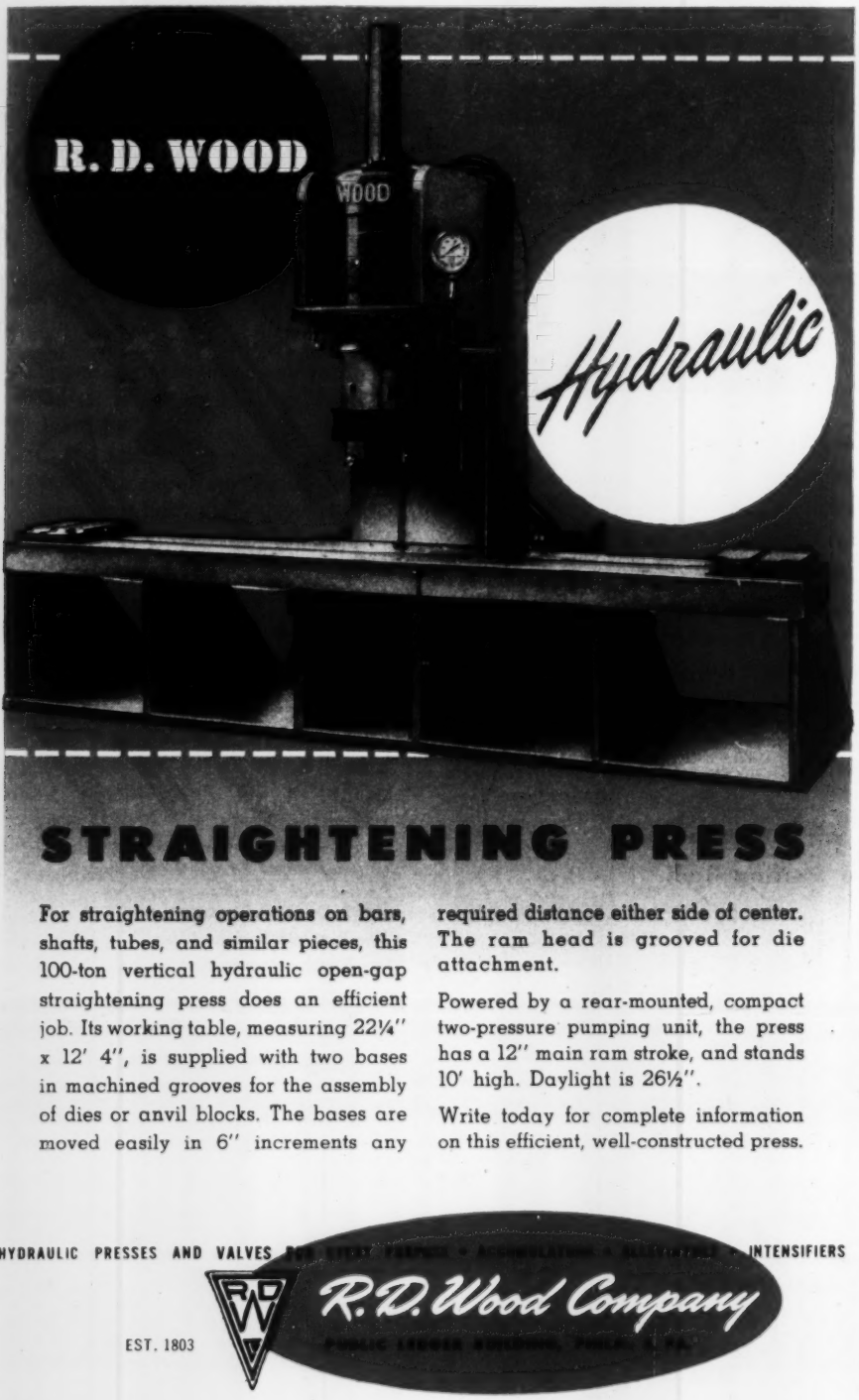
Uses Various Abrasive Wheels

Silicon carbide abrasive, diamond and steel bonded diamond wheels may be used with the model GF-2A bench grinding and lapping machine



developed by Wickman Mfg. Co., 15533 Woodrow Wilson Ave., Detroit 3, Mich. It incorporates a 1 hp reversible motor, 12 gallons per hour impeller type coolant pump, and swiveling wheel guard. A second wheel guard is provided for use with ordinary abrasive wheels.

A three-position table provides for wheel wear. A milled protractor



For straightening operations on bars, shafts, tubes, and similar pieces, this 100-ton vertical hydraulic open-gap straightening press does an efficient job. Its working table, measuring 22¼" x 12' 4", is supplied with two bases in machined grooves for the assembly of dies or anvil blocks. The bases are moved easily in 6" increments any **required distance either side of center. The ram head is grooved for die attachment.**

Powered by a rear-mounted, compact two-pressure pumping unit, the press has a 12" main ram stroke, and stands 10' high. Daylight is 26½".

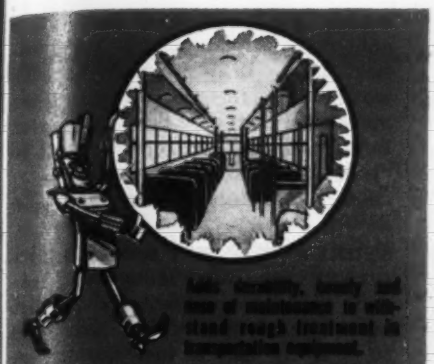
Write today for complete information on this efficient, well-constructed press.

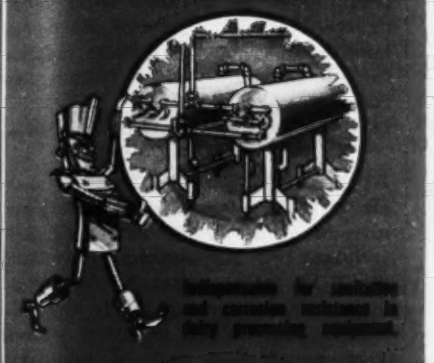
HYDRAULIC PRESSES AND VALVES FOR EVERY PURPOSE • ACCUMULATORS • ELECTRONICS • INTENSIFIERS

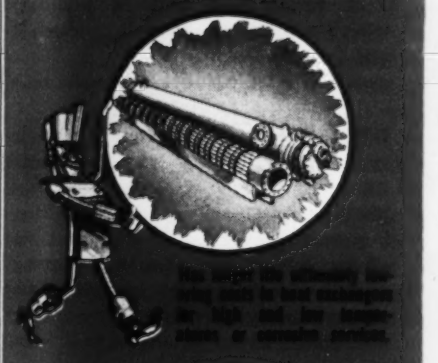
EST. 1803

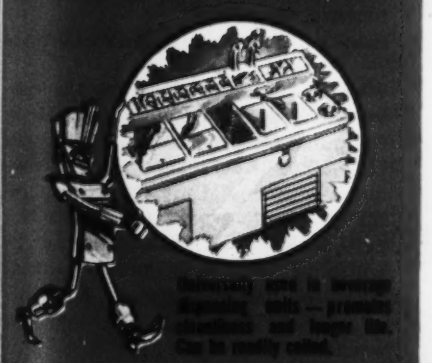
R.D. Wood Company

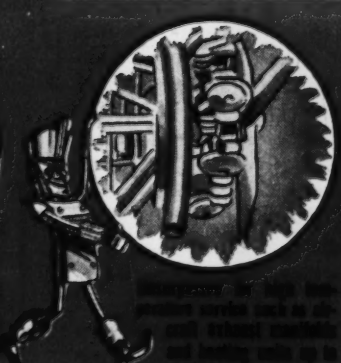
PUBLIC LEDGER BUILDING, PHILA. 5, PA.











SPECIFY "Standard" STAINLESS for product improvement

Build in the quality your product needs to meet the challenge of competitive markets with "Standard" Welded Stainless Tubing. In many applications the ultimate cost of Stainless is less than tubing made from other materials. And you get smarter, more attractive styling—rugged durability—corrosion and heat resistance—in a tubing that can take it. "Standard" Stainless is easy to fabricate, resulting in more economical manufacturing techniques for you. Let Standard's 25 years of tubing experience assist you in developing methods for product improvement requiring the use of high quality Welded Stainless Steel Tubing.

SIZE AND THICKNESS CHART
for STAINLESS STEEL TUBING

TUBE DIAMETER	MAXIMUM WALL		MINIMUM WALL	
*O.D. SIZE	DECIMAL	B. W. GAUGE	DECIMAL	B. W. GAUGE
3/8"	.035"	20	.025"	23
1/2"	.035"	20	.025"	23
5/8"	.049"	18	.028"	22
3/4"	.049"	18	.028"	22
7/8"	.065"	16	.028"	22
1"	.083"	14	.028"	22
1-1/8"	.083"	14	.028"	22
1-1/4"	.083"	14	.028"	22
1-3/8"	.083"	14	.028"	22
1-1/2"	.095"	13	.035"	20
1-5/8"	.095"	13	.035"	20
1-3/4"	.095"	13	.035"	20
1-7/8"	.095"	13	.035"	20
2"	.095"	13	.035"	20
2-1/4"	.095"	13	.035"	20
2-1/2"	.095"	13	.035"	20
2-3/4"	.095"	13	.035"	20
3"	.095"	13	.035"	20

*Intermediate sizes within the range indicated can also be manufactured. Please consult us for sizes not listed.

THE STANDARD TUBE CO.
Detroit 28, Michigan
Welded Tubing — Fabricated Parts
STANDARDIZE with STANDARD — It Pays

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slot and a coolant filter are also included. Flash protectors on each wheel guard control coolant splashing. Coolant filter can be removed. Reservoir is fitted with a coolant drain for cleaning.

Check No. 13 on Reply Card for more Details

Spot Welds a Variety of Parts

Adaptable to spot welding many different products is this machine, product of Taylor-Winfield Corp., Warren, O. Minor gear and cam alterations permit spot spacing and electrode positioning on the outline of any curved surface within the maximum movement limitation of the equipment. Welder is equipped with one transformer for two welds.

Spot spacing, work welding, and electric operation are automatically controlled. Electrodes are always normal or perpendicular to the surface being welded. Required unloading and reloading time is so short that one operator can service three welders.

Check No. 14 on Reply Card for more Details

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SALVAGE NICKEL SCRAP: Anode baskets for salvaging nickel scrap are available from Automotive Rubber Co. Inc., Detroit 4, Mich. They have welded steel cores and are completely coated with semihard rubber. Baskets are suspended from anode rail and new anodes are suspended inside the baskets with scrap packed tightly around them.

Check No. 15 on Reply Card for more Details

DETERMINES CARBON: Employing induction heating, a new electronic instrument, the Combustron, is announced by Burrell Corp., Pittsburgh, Pa., for rapid and accurate determination of carbon by combustion. It is a compact, bench-mounted, self-contained instrument and operates on 115 or 230 v, 60 cycle, single phase power supply.

Check No. 16 on Reply Card for more Details

RESISTS JOINT LEAKAGE: Spangseal, developed by Spang-Chalfant Division, National Supply Co., Pittsburgh, Pa., is an oil well tubing connection that consists of an integral joint equipped with standard API thread in conjunction with a conical sealing surface.

Check No. 17 on Reply Card for more Details

DRAWS GRAPHIC CHARTS: Improved hand tachographs that draw graphic charts of speeds on a traveling paper strip are available from O. Zernickow Co., New York 7, N. Y. Everything the tachometer indicates is recorded for reference. Time is marked horizontally and speed vertically.

Check No. 18 on Reply Card for more Details

DRILL PRESS VISE: Palmgren No. 40 drill press vise, introduced by Chicago Tool & Engineering Co., Chicago 17, Ill., is designed for shop operations such as milling, drilling and grinding. Jaws are 3½ inches wide and open 3½ inches and have a jaw depth of 1⅝ inches. Movable jaw is grooved vertically for holding round work.

Check No. 19 on Reply Card for more Details

AIR-OPERATED CLAMPS: Two new air-operated clamps have been added to the Knu-Vise line by Lapeer Mfg. Co., Lapeer, Mich. Model AO-200 has a clamping force of 200 pounds at the end of the toggle bar and model AO-400 has a force of 1200 pounds. Toggle bar is in the form of a channel which permits spindle to be moved along its full length to accommodate work at hand.

Check No. 20 on Reply Card for more Details

FUSE CUTOUT: For use on high capacity distribution feeders or wherever high interrupting capacity is wanted, new 100 ampere heavy-duty enclosed indicating fuse cutout is available from Transformer and Allied Product Divisions, General Electric Co., Schenectady 5, N. Y. It has an interrupting rating of 5000 rms-amperes at 5200 v and 8000 rms-amperes at 2500 v.

Check No. 21 on Reply Card for more Details

36-INCH GAGE: A 36-inch model Pla-Chek gage is introduced by Cadillac Gage Co., Detroit 5, Mich. It is made from a hardened steel bar that contains 36 steps spaced 1 inch apart. A micrometer screw thread is ground on the lower end and a large micrometer thimble above is graduated in 0.0001-inch.

Check No. 22 on Reply Card for more Details

WON'T BURN OUT: Operating range of No. 8 rotary vane air motor, made by Gast Mfg. Corp., Benton Harbor, Mich., is from ½-hp at 500 rpm to 3 hp at 1500 rpm for the reversible type. Nonreversible models deliver up to 4 hp. It is a variable speed drive with simple valve control and cannot burn out when slowed or stalled.

Check No. 23 on Reply Card for more Details

BARREL POLISHING COMPOUND: Korn-Kube, a new barrel polishing compound for all metals, plastics, rubber, wood and other materials is announced by Kube-Kut Inc., Garfield, N. J. It is composed of hardwood in cube form and dried to which macerated corn cobs have been added. Both materials are screened and aspirated to remove dust.

Check No. 24 on Reply Card for more Details

STOKER WITH TRAVELING GRATE: Centrafire stoker with traveling grate is available from Westinghouse Electric Corp., Pittsburgh 30, Pa. It has a fuel burning capacity covering a range from 30,000 to over 350,000 pounds of steam per hour and is built in sizes suitable for all standard boilers within this range.

Check No. 25 on Reply Card for more Details

DUST COLLECTORS: Two new models of Cyclone type Duskolectors are introduced by Hammond Machinery Builders Inc., Kalamazoo, Mich. Model CYO-6 is recommended for installations for exhausing air to the outside. Model CYB-6 is fitted with a dust proof bag and is adaptable where conditions permit recirculating the air.

Check No. 26 on Reply Card for more Details

DETECTS SMOKE: Smoke detector type A28E, made by Photoswitch Inc., Cambridge 42, Mass., is a new photoelectric device for air conditioning duct systems. At the first sign of smoke, it operates and through auxiliary relays (not included) may automatically turn off blowers, close automatic shutters and signal maintenance department.

Check No. 27 on Reply Card for more Details

SANDS SURFACE: Model 125 combination polisher-sander, made by Cummins Portable Tools, Chicago 40, Ill., sands flat, concave or convex metal surfaces. Unit consists of basic tool with 6-inch rubber backing pad, 6½-inch lamb's wool bonnet for polishing and three 6-inch sanding disks for use on different materials, a washer and nut set and two wrenches.

Check No. 28 on Reply Card for more Details

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Market Summary

STEEL procurement difficulties are mounting in step with the expanding defense program. DO and other rated tonnage still is relatively small. Bulk of output is moving into civilian goods channels. But manufacturers are unable to build substantial inventories. As a result, acute supply conditions are anticipated in first and second quarters when full impact of priority tonnage is expected. Whether conditions will give rise to such serious economic dislocations as to force some departure by the government and the mills from agreed-upon distribution policies, only time will tell. Credit curbs and other government controls, by that time, may have resulted in cutbacks in civilian demand sufficient to materially ease the pressure on overall steel supply. That, at least, is the hope right now.

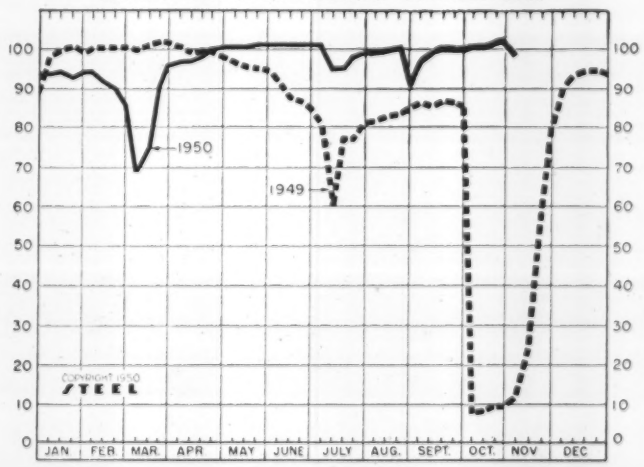
SCHEDULING—Steelmakers are confronted with the necessity of soon setting up January rolling schedules. Assuming 45 days lead time for rated orders, the deadline for January tonnage falls around Nov. 15. Most producers are setting aside the minimum percentage established by the National Production Authority for military orders, and, in addition, they are providing for the stipulated allocations for railroad cars. There also may be other programmed tonnages providing they are set up before mid-November. What these will amount to is uncertain. Further, yearend carryovers will have to be provided for. On most major carbon products these arrearages, along with preference work, will be more than enough to preclude acceptance of much new non-rated work for January, and possibly February.

BOOKING POLICY—Instead of opening books for the entire first quarter there is an increasing swing by producers toward the distribution of tonnage on a month-to-month basis. In some products this is not new, but there will be other products put on this basis for the first time, at least by some makers. However, some sellers will continue to quote on a quarterly basis. Some tonnage is being accepted for first quarter, hot-rolled alloy bars for instance. In cold-drawn bars orders are being accepted for as late as second quarter, but cautiously, and on a highly selective basis because of uncertainty with respect to hot bar supplies. Leading sellers of electrical sheets and certain other specialties requiring longer processing time have set up rolling schedules beyond first of the year, but these are exceptions. Light, flat-rolled steelmakers are delaying scheduling as long as possible because of uncertainty as regards additional rated tonnage, including warehouse allotments.

PRICES—Biggest question before the market at the moment is: How much will steel prices rise once current wage negotiations are out of the way? Extent of the increase will depend largely on the extent of wage concessions, but guesses range from a minimum of $5 per ton on the average to over $8. Most of the larger producers are expected to defer action until U. S. Steel subsidiaries announce policy. Meanwhile, scattered upward advances continue. These are reflected in STEEL's weighted index of finished steel prices which last week rose to 157.76 from 157.62. The arithmetical composite held unchanged at $95.09, as did the pig iron composites with basic, $48.28, No. 2 foundry, $49.35 and malleable, $47.27. Scrap prices are firm with underlying strength showing here and there. The steelmaking grade composite last week held steady at $41.67.

PRODUCTION—Wildcat strike at Bethlehem Steel's Lackawanna plant, which dropped the Buffalo district's operating rate 75 points to only 29 per cent of capacity, resulted in a 4 point decline in the national ingot rate to 98.5 per cent. This was the lowest rate recorded since the week ended Sept. 9.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended Nov. 4	Change	Same Week 1949	Same Week 1948
Pittsburgh	104	— 1*	2	96
Chicago	104.5	— 1*	5.5	99
Eastern Pa.	100	0	30	95
Youngstown	106	0	0	105
Wheeling	98	+ 1	61	91
Cleveland	97.5	— 3.5	0	99.5
Buffalo	29	—75	32.5	104
Birmingham	100	0	6	100
New England	91	— 1	58	90
Cincinnati	106	0	52	106
St. Louis	88.5	—10.5	91.5	89.5
Detroit	106	0	37	100
Western	99	— 0.5	21.5	..
Estimated national rate	98.5	— 4	12	99

Based on weekly steelmaking capacity of 1,906,267 net tons for first half and 1,926,803 second half, 1950; 1,843,516 net tons for 1949; 1,802,476 net tons for 1948. *Change from revised rate.

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Composite Market Averages

	Nov. 2 1950	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
FINISHED STEEL INDEX, Weighted:					
Index (1935-39 av.=100)	157.76	157.62	157.28	152.52	101.87
Index in cents per lb. ..	4.274	4.270	4.261	4.132	2.760
ARITHMETICAL PRICE COMPOSITES:					
Finished Steel, NT	$95.09	$95.09	$94.64	$91.64	$58.27
No. 2 Fdry, Pig Iron, GT	49.35	49.35	48.97	46.10	25.42
Basic Pig Iron, GT.....	48.28	48.10	47.72	45.60	24.75
Malleable Pig Iron, GT .	49.63	49.63	49.20	47.27	26.04
Steelmaking Scrap, GT..	41.67	41.67	41.00	28.00	19.17

Weighted finished steel index based on average shipments and Pittsburgh district prices of the following 14 representative products during 5-year base period 1935-39. Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see STEEL, Sept. 19, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are based on average prices at Pittsburgh, Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown. Malleable composite based on same points, except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS

	Nov. 2 1950	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh....	3.45	3.45	3.45	3.35	2.25
Bars, H.R., Chicago	3.45	3.45	3.45	3.35	2.25
Bars, H.R., del. Philadelphia	3.93	3.93	3.93	3.83	2.57
Bars, C.F., Pittsburgh	4.15	4.15	4.10–15	3.95–4.00	2.75
Shapes, Std., Pittsburgh ..	3.40	3.40	3.40	3.25	2.10
Shapes, Std., Chicago	3.40	3.40	3.40	3.25	2.10
Shapes, del. Philadelphia..	3.46	3.46	3.46	3.50	2.215
Plates, Pittsburgh	3.50	3.50	3.50	3.40	2.25
Plates, Chicago	3.50	3.50	3.50	3.40	2.25
Plates, Coatesville, Pa. ...	3.90	3.90	3.90	3.50	2.25
Plates, Sparrows Point, Md.	3.50	3.50	3.50	3.40	2.25
Plates, Claymont, Del. ...	3.90	3.90	3.90	3.50	2.25
Plates, del. Philadelphia ..	3.84	3.84	3.84	3.59	2.30
Sheets, H.R., Pittsburgh..	3.35	3.35	3.35	3.25	2.20
Sheets, H.R., Chicago	3.35	3.35	3.35	3.25	2.20
Sheets, C.R., Pittsburgh ..	4.10	4.10	4.10	4.00	3.05
Sheets, C.R., Chicago	4.10	4.10	4.10	4.00	3.05
Sheets, C.R., Detroit	4.30	4.30	4.30	4.20	3.15
Sheets, Galv., Pittsburgh..	4.40	4.40	4.40	4.40	3.70
Strip, H.R., Pittsburgh ...	3.50–75	3.50–75	3.50	3.25	2.10
Strip, H.R., Chicago	3.25	3.25	3.25	3.25	2.10
Strip, C.R., Pittsburgh	4.15–85	4.15–85	4.15–50	4.00	2.80
Strip, C.R., Chicago	4.30	4.30	4.30	4.00–15	2.90
Strip, C.R., Detroit	4.35–95	4.35–95	4.35–95	4.20–25	2.90
Wire, Basic, Pittsburgh ...	4.50–75	4.50–75	4.50–75	4.15	2.75
Nails, Wire, Pittsburgh ...	5.30–60	5.30–60	5.30–60	5.15	2.90
Tin plate, box, Pittsburgh.	$7.50	$7.50	$7.50	$7.75	$5.00

SEMIFINISHED

Billets, forging, Pitts. (NT)	$63.00	$63.00	$63.00	$61.00	$42.00
Wire rods, 7/32-5/16", Pitts...	3.85	3.85	3.85	3.40	2.15

PIG IRON, Gross Ton

Bessemer, Pitts.	$47-$50	$47-$50	$47-$50	$47.00	$26.25
Basic, Valley	49.00	46-49	46-49	46.00	25.25
Basic, del. Phila.	53.39	53.39	50.39	49.44	27.09
No. 2 Fdry, Pitts.	49.50	49.50	49.50	46.50	25.75
No. 2 Fdry, Chicago	49.50	49.50	49.50	46.50	25.75
No. 2 Fdry, Valley	49.50	49.50	49.50	46.50	25.75
No. 2 Fdry, del. Phila. ...	53.89	53.89	50.89	49.94	27.59
No. 2 Fdry, Birm.	45.88	45.88	45.88	39.38	22.13
No. 2 Fdry (Birm.) del. Cin.	52.58	52.58	52.58	46.08	25.81
Malleable, Valley	49.50	49.50	49.50	46.50	25.75
Malleable, Chicago ..	46.50-49.50	46.50-49.50	46.50-49.50	46.50	25.75
Charcoal, Lyles, Tenn. ...	62.00	62.00	62.00	60.00	33.00
Ferromanganese, Etna, Pa.	175.0	175.00	175.00	175.00	140.00*

* Delivered, Pittsburgh.

SCRAP, Gross Ton

No. 1 Heavy Melt. Pitts..	$44.00	$44.00	$44.00	$29.50	$20.00
No. 1 Heavy Melt. E. Pa..	41.00	41.00	39.00	25.00	18.75
No. 1 Heavy Melt. Chicago	40.00	40.00	40.00	29.50	18.75
No. 1 Heavy Melt. Valley.	43.75	43.75	43.75	29.25	20.00
No. 1 Heavy Melt. Cleve...	43.25	43.25	42.75	26.50	19.50
No. 1 Heavy Melt. Buffalo.	41.50	41.50	41.50	27.25	19.25
Rails, Rerolling, Chicago..	64.50	64.50	61.00	44.50	22.25
No. 1 Cast, Chicago.....	53.50	53.50	50.50	41.50	20.00

Coke, Net Ton

Beehive, Furn., Connlsvl...	$14.25	$14.25	$14.25	$13.25	$7.50
Beehive, Fdry., Connlsvl...	16.50	16.50	16.50	15.75	8.25
Oven Fdry., Chicago	21.00	21.00	21.00	20.00	13.00

NONFERROUS METALS

Copper, del. Conn.	24.50	24.50	24.50	17.625-18.50	12.00
Zinc, E. St. Louis	17.50	17.50	17.50	9.75	8.25
Lead, St. Louis	16.80	15.80	15.80	12.80	6.35
Tin, New York	131.00	119.75	106.00	94.00	52.00
Aluminum, del.	19.00	19.00	19.00	17.00	15.00
Antimony, Laredo, Tex. ..	32.00	32.00	32.00	32.00	14.50
Nickel, refinery, duty paid.	48.00	48.00	48.00	40.00	35.00

Pig Iron

For key to producing companies, turn next page.
Minimum delivered prices do not include 3% federal tax.

PIG IRON, Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa. B2	$51.00	$51.50	$52.00	$52.50
Brooklyn, N.Y., del.	....	55.79	56.29	....
Newark, del.	53.63	54.13	54.63	55.13
Philadelphia, del.	53.39	53.89	54.39	54.89
Birmingham District				
Alabama City, Ala. R2	45.38	45.88	....	....
Birmingham R2	45.38	45.88	....	....
Birmingham S9	45.38	45.88	....	....
Woodward, Ala. W15	45.38	45.88	....	....
Cincinnati, del.	....	52.58	....	....
Buffalo District				
Buffalo H1, R2	49.00	49.50	50.00	....
Tonawanda, N.Y., W12	49.00	49.50	50.00	....
N. Tonawanda, N.Y., T9	....	49.50	50.00	....
Boston, del.	58.26	58.76	59.20	....
Rochester, N.Y., del.	51.63	52.13	52.63	....
Syracuse, N.Y., del.	52.58	53.08	53.58	....
Chicago District				
Chicago I-3	49.00	49.50	49.50	50.00
Gary, Ind. C3	46.00	....	46.50	....
Indiana Harbor, Ind. I-2	49.00	....	49.50	....
So. Chicago, Ill. W14	49.00	49.50	49.50	....
So. Chicago, Ill. Y1	49.00	49.50	49.50	....
So. Chicago, Ill. C3	46.00	....	46.50	47.00
Milwaukee, del.	47.89	51.39	48.39	48.89
Muskegon, Mich., del.	....	54.98	51.98	....
Cleveland District				
Cleveland A7	46.00	46.50	46.50	47.00
Cleveland R2	49.00	49.50	49.50	....
Akron, del. from Cleve.	48.39	48.89	48.89	49.39
Lorain, O. N3	46.00	....	....	47.00
Duluth I-3	....	....	49.50	....
Erie, Pa. I-3	49.00	49.50	49.50	50.00
Everett, Mass. E1	....	52.25	52.75	....
Fontana, Calif. K1	*55.00*	*55.50*	....	....
Geneva, Utah G1	46.00	46.50	....	....
Seattle, Tacoma, Wash., del.	....	54.20	....	....
Portland, Oreg., del	....	54.20	....	....
Los Angeles, San Francisco, del. ...	53.70	54.20	....	....
Granite City, Ill. M10	50.90	51.40	51.90	....
St. Louis, del. (inc. tax)	51.65	52.15	52.65	....
Ironton, Utah C11	46.00	46.50	....	....
Lone Star, Tex. L6	45.00	*45.50	45.50	....
Minnequa, Colo. C10	49.00	49.50	50.00	....
Pittsburgh District				
Neville Island, Pa. P6	....	49.50	49.50	50.00
Pitts., N.&S. sides, Ambridge, Aliquippa, del.	....	50.69	50.69	51.19
McKees Rocks, del.	....	50.45	50.45	50.95
Lawrenceville, Homestead, McKeesport, Monaca, del.	....	50.94	50.94	51.44
Verona, del.	....	51.40	51.40	51.90
Brackenridge, del.	....	51.63	51.63	52.13
Bessemer, Pa. C3	46.00	....	46.50	47.00
Clairton, Rankin, So. Duquesne, Pa. C3	46.00	....	....	....
McKeesport, Pa. N3	46.00	....	....	47.00
Sharpsville, Pa. S6	....	....	49.50	50.00
Steelton, Pa. B2	51.00	51.50	52.00	52.50
Swedeland, Pa. A3	53.00	53.50	54.00	54.50
Toledo, O. I-3	49.00	49.50	49.50	50.00
Cincinnati, del.	54.01	54.51	....	....
Troy, N.Y., R2	51.00	51.50	52.00	52.50
Youngstown District				
Hubbard, O. Y1	49.00	49.50	49.50	....
Youngstown Y1	49.00	49.50	49.50	50.00
Mansfield, O., del.	50.26	53.76	53.76	51.26

* Low phos, southern grade.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si over base grade, 1.75-2.25%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1%, or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1.50 for each 0.5% Si)

Jackson, O. G2, J1	$59.50
Buffalo H1	58.25

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 for 0.045% max. P)

Niagara Falls, N.Y. P15	$78.00
Keokuk, Iowa, Openhearth & Fdry. frt. allowed K2	82.00
Keokuk, Iowa, OH & Fdry., 12½ lb. piglets, frt. allowed K2...	86.00
Wenatchee, Wash., OH & Fdry., frt. allowed K2	82.00

CHARCOAL PIG IRON, Gross Ton

(Low phos, semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles, Tenn. T3	$62.00

LOW PHOSPHOROUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$51.00
Steelton, Pa. B2	57.00
Philadelphia delivered	57.00
Troy, N.Y. R2	57.00

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Semifinished and Finished Steel Products

Mill prices as reported to STEEL Nov. 2, 1950; cents per pound except as otherwise noted. Changes shown in italics. Code numbers following mill points indicate producing company; key on next two pages.

INGOTS, Carbon, Forging (NT)
Detroit R7 ..... $50.00
Fontana, Calif. K1 ..... 76.00
Munhall, Pa. C3 ..... 50.00

INGOTS, Alloy (NT)
Detroit R7 ..... $51.00
Fontana, Calif. K1 ..... 77.00
Houston, Tex. S5 ..... 59.00
Midland, Pa. C18 ..... 51.00
Munhall, Pa. C3 ..... 51.00
So. Duquesne, Pa. C3 ..... 51.00

BILLETS, BLOOMS & Slabs
Carbon, Rerolling (NT)
Bessemer, Pa. C3 ..... $53.00
Clairton, Pa. C3 ..... 53.00
Conshohocken, Pa. A3 ..... 62.00
Ensley, Ala. T2 ..... 53.00
Fairfield, Ala T2 ..... 53.00
Fontana, Calif. K1 ..... 72.00
Gary, Ind. C3 ..... 53.00
Johnstown, Pa. B2 ..... 53.00
Lackawanna, N.Y. B2 ..... 53.00
Munhall, Pa. C3 ..... 53.00
So. Chicago, Ill. C3 ..... 53.00
So. Duquesne, Pa. C3 ..... 53.00

Carbon, Forging (NT)
Bessemer, Pa. C3 ..... $63.00
Buffalo R2 ..... 63.00
Canton, O. R2 ..... 63.00
Clairton, Pa. C3 ..... 63.00
Cleveland R2 ..... 63.00
Conshohocken, Pa. A3 ..... 68.00
Detroit R7 ..... 66.00
Ensley, Ala T2 ..... 63.00
Fairfield, Ala. T2 ..... 63.00
Fontana, Calif. K1 ..... 82.00
Gary, Ind. C3 ..... 63.00
Geneva, Utah G1 ..... 63.00
Houston, Tex. S5 ..... 71.00
Ind. Harbor, Ind. I-2 ..... 63.00
Johnstown, Pa. B2 ..... 63.00
Lackawanna, N.Y. B2 ..... 63.00
LosAngeles B3 ..... 82.00
Munhall, Pa. C3 ..... 63.00
Seattle B3 ..... 82.00
So. Chicago C3, R2, W14 ..... 63.00
So. Duquesne, Pa. C3 ..... 63.00
So. SanFrancisco B3 ..... 82.00

Alloy (NT)
Bethlehem, Pa. B2 ..... $66.00
Buffalo R2 ..... 66.00
Canton, O. R2, T7 ..... 66.00
Conshohocken, Pa. A3 ..... 70.00
Detroit R7 ..... 66.00
Fontana, Calif. K1 ..... 85.00
Gary, Ind. C3 ..... 66.00
Houston, Tex. S5 ..... 74.00
Ind. Harbor, Ind. Y1 ..... 66.00
Johnstown, Pa. B2 ..... 66.00
Lackawanna, N.Y. B2 ..... 66.00
LosAngeles B3 ..... 86.00
Massillon, O. R2 ..... 66.00
Midland, Pa. C18 ..... 66.00
Munhall, Pa. C3 ..... 66.00
So. Chicago C3, R2, W14 ..... 66.00
So. Duquesne, Pa. C3 ..... 66.00
Warren, O. C17 ..... 66.00
Youngstown Y1 ..... 66.00

ROUNDS, SEAMLESS TUBE (NT)
Canton, O. R2 ..... $76.00
Cleveland R2 ..... 76.00
Fontana, Calif. K1 ..... 100.00
Gary, Ind. C3 ..... 76.00
Ind. Harbor, Ind. I-2 ..... 76.00
Massillon, O. R2 ..... 76.00
So. Chicago, Ill. R2 ..... 76.00
So. Duquesne, Pa. C3 ..... 76.00

SHEET BARS (NT)
Fontana, Calif. K1 ..... $86.00

SKELP
Aliquippa, Pa. J5 ..... 3.25
Munhall, Pa. C3 ..... 3.15
Warren, O. R2 ..... 3.15
Youngstown C3, R2 ..... 3.15

WIRE RODS
AlabamaCity, Ala. R2 ..... 3.85
Buffalo W12 ..... 3.85
Cleveland A7 ..... 3.85
Donora, Pa. A7 ..... 3.85
Fairfield, Ala. T2 ..... 3.85
Fontana, Calif. K1 ..... 4.60
Houston, Tex. S5 ..... 4.25
Ind. Harbor, Ind. Y1 ..... 3.85
Johnstown, Pa. B2 ..... 3.85
Joliet, Ill. A7 ..... 3.85
LosAngeles B3 ..... 4.65
Minnequa, Colo. C10 ..... 4.10
Monessen, Pa. P7 ..... 4.05
No. Tonawanda, N.Y. B11 ..... 3.85
Pittsburg, Calif. C11 ..... 4.50
Portsmouth, O. P12 ..... 3.85
Roebling, N.J. R5 ..... 3.95
So. Chicago, Ill. R2 ..... 3.85
SparrowsPoint, Md. B2 ..... 3.95
Sterling, Ill. (1) N15 ..... 4.10
Struthers, O. Y1 ..... 3.85
Torrance, Calif. C11 ..... 4.65
Worcester A7 ..... 4.15

STRUCTURALS
Carbon Steel Stand. Shapes
AlabamaCity, Ala. R2 ..... 3.40
Aliquippa, Pa. J5 ..... 3.40
Bessemer, Ala. T2 ..... 3.40
Bethlehem, Pa. B2 ..... 3.45
Clairton, Pa. C3 ..... 3.40
Fairfield, Ala. T2 ..... 3.40
Fontana, Calif. K1 ..... 4.00
Gary, Ind. C3 ..... 3.40
Geneva, Utah G1 ..... 3.40
Houston, Tex. S5 ..... 3.80
Ind. Harbor, Ind. I-2 ..... 3.40
Johnstown, Pa. B2 ..... 3.45
KansasCity, Mo. S5 ..... 4.00
Lackawanna, N.Y. B2 ..... 3.45
LosAngeles B3 ..... 4.00
Minnequa, Colo. C10 ..... 3.85
Munhall, Pa. C3 ..... 3.40
Niles, Calif. (22) P1 ..... 4.02
Phoenixville, Pa. P4 ..... 4.25
Portland, Oreg. O4 ..... 4.25
Seattle B3 ..... 4.05
So. Chicago, Ill. C3, W14 ..... 3.40
So. SanFrancisco B3 ..... 3.95
Torrance, Calif. C11 ..... 4.00
Weirton, W. Va. W6 ..... 3.40

Alloy Stand. Shapes
Clairton, Pa. C3 ..... 4.05
Fontana, Calif. K1 ..... 5.25
Munhall, Pa. C3 ..... 4.05
So. Chicago, Ill. C3 ..... 4.05

H.S., L.A. Stand. Shapes
Aliquippa, Pa. J5 ..... 5.15
Bessemer, Ala. T2 ..... 5.15
Bethlehem, Pa. (14) B2 ..... 5.20
Clairton, Pa. C3 ..... 5.15
Fairfield, Ala. T2 ..... 5.15
Fontana, Calif. K1 ..... 5.75
Gary, Ind. C3 ..... 5.15
Geneva, Utah G1 ..... 5.10
Ind. Harbor, Ind. I-2 ..... 5.15
Ind. Harbor, Ind. Y1 ..... 5.40
Johnstown, Pa. B2 ..... 5.20
Lackawanna, N.Y. (14) B2 ..... 5.20
LosAngeles B3 ..... 5.75
Munhall, Pa. C3 ..... 5.15
So. Chicago, Ill. C3 ..... 5.15
So. SanFrancisco B3 ..... 5.70
Struthers, O. Y1 ..... 5.40

Wide Flange
BethlehemPa. B2 ..... 3.45
Lackawanna, N.Y. B2 ..... 3.45
Munhall, Pa. C3 ..... 3.40
So. Chicago, Ill. C3 ..... 3.40

H.S., L.A. Wide Flange
Bethlehem, Pa. B2 ..... 5.20
Lackawanna, N.Y. B2 ..... 5.20
Munhall, Pa. C3 ..... 5.10
So. Chicago, Ill. C3 ..... 5.10

SHEET STEEL PILING
Ind. Harbor, Ind. I-2 ..... 4.20
Lackawanna, N.Y. B2 ..... 4.20
Munhall, Pa. C3 ..... 4.20
So. Chicago, Ill. C3 ..... 4.20
Weirton, W. Va. W6 ..... 4.20

BEARING PILES
Munhall, Pa. C3 ..... 3.40
So. Chicago, Ill. C3 ..... 3.40

PLATES, High-Strength Low-Alloy
Aliquippa, Pa. J5 ..... 5.35
Bessemer, Ala. T2 ..... 5.35
Clairton, Pa. C3 ..... 5.35
Cleveland J5, R2 ..... 5.35
Conshohocken, Pa. A3 ..... 5.40
Ecorse, Mich. G5 ..... 5.85
Fairfield, Ala. T2 ..... 5.35
Fontana, Calif. K1 ..... 5.95
Gary, Ind. C3 ..... 5.35
Geneva, Utah G1 ..... 5.35
Ind. Harbor, Ind. I-2 ..... 5.35
Ind. Harbor, Ind. Y1 ..... 5.60
Johnstown, Pa. B2 ..... 5.35
Munhall, Pa. C3 ..... 5.35
Pittsburgh J5 ..... 5.35
Sharon, Pa. S3 ..... 5.70
So. Chicago, Ill. C3 ..... 5.35
SparrowsPoint, Md. B2 ..... 5.35
Warren, O. R2 ..... 5.35
Youngstown Y1 ..... 5.60

PLATES, Open-Hearth Alloy
Claymont, Del. W16 ..... 4.50
Coatesville, Pa. L7 ..... 4.80
Conshohocken, Pa. A3 ..... 4.55
Fontana, Calif. K1 ..... 5.40
Gary, Ind. C3 ..... 4.40
Johnstown, Pa. B2 ..... 4.40
Munhall, Pa. C3 ..... 4.40
Sharon, Pa. S3 ..... 4.75
So. Chicago, Ill. C3 ..... 4.40
SparrowsPoint, Md. B2 ..... 4.40

FLOOR PLATES
Cleveland J5 ..... 4.55
Conshohocken, Pa. A3 ..... 4.55
Harrisburg, Pa. C5 ..... 5.25
Ind. Harbor, Ind. I-2 ..... 4.55
Munhall, Pa. C3 ..... 4.55
So. Chicago, Ill. C3 ..... 4.55

PLATES (Universal Mill)
Fontana, Calif. K1 ..... 4.40

PLATES, Carbon A.R.
Fontana, Calif. K1 ..... 5.25

PLATES, Carbon Steel
AlabamaCity, Ala. R2 ..... 3.50
Aliquippa, Pa. J5 ..... 3.50
Ashland, Ky. (15) A10 ..... 3.50
Bessemer, Ala. T2 ..... 3.50
Clairton, Pa. C3 ..... 3.50
Claymont, Del. W16 ..... 3.90
Cleveland J5 R2 ..... 3.50
Coatesville, Pa. L7 ..... 3.90
Conshohocken, Pa. A3 ..... 3.75
Ecorse, Mich. G5 ..... 3.75
Fairfield, Ala. T2 ..... 3.50
Fontana, Calif. K1 ..... 4.10
Gary, Ind. C3 ..... 3.50
Granite City, Ill. G4 ..... 4.20
Geneva, Utah G1 ..... 3.50
Harrisburg, Pa. C5 ..... 4.25
Houston, Tex. S5 ..... 3.90
Ind. Harbor, Ind. I-2, Y1 ..... 3.50
Johnstown, Pa. B2 ..... 3.50
Lackawanna, N.Y. B2 ..... 3.50
Minnequa, Colo. C10 ..... 4.30
Munhall, Pa. C3 ..... 3.50
Pittsburgh J5 ..... 3.50
Sharon, Pa. S3 ..... 3.75
Sharon, Pa. S3 ..... 3.50
So. Chicago, Ill. C3, W14 ..... 3.50
SparrowsPoint, Md. B2 ..... 3.50
Steubenville, O. W10 ..... 3.50
Warren, O. R2 ..... 3.50
Weirton, W. Va. W6 ..... 3.50
Youngstown C3, R2, Y1 ..... 3.50

PLATES, Wrought Iron
Economy, Pa. B14 ..... 7.85

PLATES, Ingot Iron
Ashland, c.l. (15) A10 ..... 3.75
Ashland, lcl (15) A10 ..... 4.25
Cleveland, cl. R2 ..... 4.10
Warren, O. cl R2 ..... 4.10

BARS, Hot-Rolled Carbon
AlabamaCity, Ala. R2 ..... 3.45
Aliquippa, Pa. J5 ..... 3.45
Alton, Ill. (1) L1 ..... 3.45
Atlanta, Ga. A11 ..... 4.00
Bessemer, Ala. T2 ..... 3.45
Buffalo R2 ..... 3.45
Canton, O. R2 ..... 3.45
Clairton, Pa. C3 ..... 3.45
Cleveland R2 ..... 3.45
Ecorse, Mich. G5 ..... 3.65
Emeryville, Calif. J7 ..... 4.20
Fairfield, Ala. T2 ..... 3.45
Fontana, Calif. K1 ..... 4.10
Gary, Ind. C3 ..... 3.45
Houston, Tex. S5 ..... 3.85
Ind. Harbor, Ind. I-2, Y1 ..... 3.45
Johnstown, Pa. B2 ..... 3.45
KansasCity, Mo. S5 ..... 4.05
Lackawanna, N.Y. B2 ..... 3.45
LosAngeles B3 ..... 4.15
Milton, Pa. B6 ..... 3.70
Minnequa, Colo. C10 ..... 3.90
Niles, Calif. P1 ..... 4.17
N. Tonawanda, N.Y. B11 ..... 3.45
Pittsburg, Calif. C11 ..... 4.15
Pittsburgh J5 ..... 3.45
Portland, Oreg. O4 ..... 4.40
Seattle B3, N14 ..... 4.20
So. Chicago C3, R2, W14 ..... 3.45
So. Duquesne, Pa. C3 ..... 3.45
S. SanFran., Cal. B3 ..... 4.20
Struthers, O. Y1 ..... 3.45
Torrance, Calif. C11 ..... 4.15
Weirton, W. Va. W6 ..... 3.45
Youngstown C3, R2 ..... 3.45

BAR SIZE ANGLES; S. SHAPES
Aliquippa, Pa. J5 ..... 3.45
Atlanta A11 ..... 4.00
Johnstown, Pa. B2 ..... 3.45
Lackawanna, N.Y. B2 ..... 3.45
Niles, Calif. P1 ..... 4.17
Pittsburgh (23) J5 ..... 3.45
Portland, Oreg. O4 ..... 4.20
SanFrancisco S7 ..... 4.00
Weirton, W. Va. W6 ..... 3.45

BAR SIZE ANGLES; H.R. CARBON
Bethlehem, Pa. B2 ..... 3.65

BARS, Hot-Rolled Alloy
Bethlehem, Pa. B2 ..... 3.95
Buffalo R2 ..... 3.95
Canton, O. R2, T7 ..... 3.95
Clairton, Pa. C3 ..... 3.95
Ecorse, Mich. G5 ..... 4.25
Fontana, Calif. K1 ..... 4.95
Gary, Ind. C3 ..... 3.95
Houston, Tex. S5 ..... 4.35
Ind. Harbor, Ind. I-2, Y1 ..... 3.95
Johnstown, Pa. B2 ..... 3.95
KansasCity, Mo. S5 ..... 4.55
Lackawanna, N.Y. B2 ..... 3.95
LosAngeles B3 ..... 5.00
Massillon, O. R2 ..... 3.95
Midland, Pa. C18 ..... 3.95
So. Chicago C3, R2, W14 ..... 3.95
So. Duquesne, Pa. C3 ..... 3.95
Struthers, O. Y1 ..... 3.95
Warren, O. C17 ..... 4.20
Youngstown C3 ..... 3.95

BAR SHAPES, Hot-Rolled Alloy
Clairton, Pa. C3 ..... 4.20
Fontana, Calif. K1 ..... 4.95
Gary, Ind. C3 ..... 4.20
Youngstown C3 ..... 4.20

BARS & SMALL SHAPES, H.R., High-Strength Low-Alloy
Aliquippa, Pa. J5 ..... 5.20
Atlanta A11 ..... 5.35
Bessemer, Ala. T2 ..... 5.20
Bethlehem, Pa. B2 ..... 5.20
Clairton, Pa. C3 ..... 5.20
Cleveland R2 ..... 5.20
Ecorse, Mich. G5 ..... 5.65
Fairfield, Ala. T2 ..... 5.20
Fontana, Calif. K1 ..... 6.25
Gary, Ind. C3 ..... 5.20
Ind. Harbor, Ind. I-2 ..... 5.20
IndianaHarbor, Ind. Y1 ..... 5.45
Johnstown, Pa. B2 ..... 5.20
Lackawanna, N.Y. B2 ..... 5.20
LosAngeles B3 ..... 5.90
Pittsburgh J5 ..... 5.20
So. Duquesne, Pa. C3 ..... 5.20
So. SanFrancisco B3 ..... 5.95
Struthers, O. Y1 ..... 5.45
Youngstown C3 ..... 5.20

BARS, Cold-Finished Carbon
Aliquippa, Pa. K5 ..... 4.15
Ambridge, Pa. W18 ..... 4.15
BeaverFalls, Pa. M12, R2 ..... 4.15
Buffalo B5 ..... 4.15
Camden, N.J. P13 ..... 4.60
Carnegie, Pa. C12 ..... 4.15
Chicago W18 ..... 4.15
Cleveland A7, C20 ..... 4.15
Detroit P17 ..... 4.30
Donora, Pa. A7 ..... 4.15
Ecorse, Mich. G5 ..... 4.35
Elyria, O. W8 ..... 4.15
FranklinPark, Ill. N5 ..... 4.15
Gary, Ind. R2 ..... 4.15
Hammond, Ind. L2, M13 ..... 4.15
Hartford, Conn. R2 ..... 4.55
Harvey, Ill. B5 ..... 4.15
LosAngeles R2 ..... 5.55
Mansfield, Mass. B5 ..... 4.55
Massillon, O. R2, R8 ..... 4.15
Midland, Pa. C18 ..... 4.15
Monaca, Pa. S17 ..... 4.15
Newark, N.J. W18 ..... 4.55
Plymouth, Mich. P5 ..... 4.40
Pittsburgh J5 ..... 4.15
Putnam, Conn. W18 ..... 4.55
Readville, Mass. C14 ..... 4.55
St. Louis, Mo. M5 ..... 4.55
So. Chicago, Ill. W14 ..... 4.15
SpringCity, Pa. (5) K3 ..... 4.55
Struthers, O. Y1 ..... 4.15
Waukegan, Ill. A7 ..... 4.15
Youngstown F3, Y1 ..... 4.15

BARS, Cold-Finished Alloy
Aliquippa, Pa. K5 ..... 4.90
Ambridge, Pa. W18 ..... 4.90
BeaverFalls, Pa. M12 ..... 4.90
Bethlehem, Pa. B2 ..... 4.90
Buffalo B5 ..... 4.90
Canton, O. R2, T7 ..... 4.90
Carnegie, Pa. C12 ..... 4.90
Chicago W18 ..... 4.90
Cleveland A7, C20 ..... 4.90
Detroit P17 ..... 5.05
Donora, Pa. A7 ..... 4.90
Elyria, O. W8 ..... 4.90
Gary, Ind. R2 ..... 4.90
Hammond, Ind. L2, M13 ..... 4.90
Hartford, Conn. R2 ..... 5.20
Harvey, Ill. B5 ..... 4.90
Lackawanna, N.Y. B2 ..... 4.90
Mansfield, Mass. B5 ..... 5.20
Massillon, O. R2, R8 ..... 4.90
Midland, Pa. C18 ..... 4.90
Monaca, Pa. S17 ..... 4.90
Newark, N.J. W18 ..... 5.20
Plymouth, Mich. P5 ..... 5.10
So. Chicago, Ill. R2, W14 ..... 4.90
Struthers, O. Y1 ..... 4.90
Warren, O. C17 ..... 4.90
Waukegan, Ill. A7 ..... 4.90
Worcester, Mass. A7 ..... 5.20
Youngstown F3, Y1 ..... 4.90

RAIL STEEL BARS
ChicagoHts. (3) I-2, C2 ..... 4.00
ChicagoHts. (4) I-2 ..... 3.45
Dallas, Tex. (4) S20 ..... 6.00
Franklin, Pa. (3) F5 ..... 4.00
FortWorth, Tex. (26) T4 ..... 4.63
Huntngtn, W. Va. (3) W7 ..... 4.00
Marion, O. (3) P11 ..... 4.00
Moline, Ill. (3) R2 ..... 3.55
Williamsport (3) S19 ..... 4.50
Williamsport (4) S19 ..... 4.60

BARS, Wrought Iron
Economy, Pa. (S.R.) B14 ..... 8.60
Economy, Pa. (D.R.) B14 ..... 11.00
Economy (Staybolt) B14 ..... 11.30
Dover, N.J. (Staybolt) U1 ..... 15.00
Dover (Eng. Bolt) U1 ..... 13.50
Dover (Wrgt. Iron) U1 ..... 12.25
McK. Rks. (S.R.) L5 ..... 8.60
McK. Rks. (D.R.) L5 ..... 11.25

BARS, Reinforcing (Fabricators)
AlabamaCity, Ala. R2 ..... 3.45
Alton, Ill. (6) L1 ..... 3.45
Atlanta A11 ..... 4.00
Buffalo R2 ..... 3.45
Cleveland R2 ..... 3.45
Emeryville, Calif. J7 ..... 4.20
Fairfield, Ala. T2 ..... 3.45
Fontana, Calif. K1 ..... 4.10
Gary, Ind. C3 ..... 3.45
Houston, Tex. S5 ..... 3.85
Ind. Harbor, Ind. I-2, Y1 ..... 3.45
IndianaHarbor, Ind. Y1 ..... 3.45
Johnstown, Pa. B2 ..... 3.45
KansasCity, Mo. S5 ..... 4.05
Lackawanna, N.Y. B2 ..... 3.45
LosAngeles B3 ..... 4.15
Milton, Pa. B6 ..... 3.70
Minnequa, Colo. C10 ..... 4.25
Niles, Calif. P1 ..... 4.17
Pittsburg, Calif. C11 ..... 4.15
Pittsburgh J5 ..... 3.45
Portland, Oreg. O4 ..... 4.70
Seattle B3, N14 ..... 4.20
So. Chicago, Ill. R2 ..... 3.45
So. Duquesne, Pa. C3 ..... 3.45
So. SanFrancisco B3 ..... 4.20
SparrowsPoint, Md. B2 ..... 3.45
Struthers, O. Y1 ..... 3.45
Torrance, Calif. C11 ..... 4.15
Youngstown C3, R2 ..... 3.45

BARS, Reinforcing (Fabricated; to Consumers)
Huntington, W. Va. W7 ..... 4.50
Johnstown, ¼-1" B2 ..... 4.35
LosAngeles B3 ..... 5.00
Marion, O. P11 ..... 4.75
Seattle B3, N14 ..... 5.10
SoSanFrancisco B3 ..... 5.00
SparrowsPt., ¼-1" B2 ..... 4.35
Williamsport, Pa. S19 ..... 4.35

SHEETS, Hot-Rolled Steel (18 gage and heavier)
AlabamaCity, Ala. R2 ..... 3.35
Ashland, Ky. (8) A10 ..... 3.35
Butler, Pa. A10 ..... 3.35
Cleveland J5, R2 ..... 3.35
Conshohocken, Pa. A3 ..... 3.60
Detroit M1 ..... 4.15
Ecorse, Mich. (8) G5 ..... 3.55
Fairfield, Ala. T2 ..... 3.35
Fontana, Calif. K1 ..... 4.25
Gary, Ind. C3 ..... 3.35
GraniteCity, Ill. G4 ..... 4.05
Geneva, Utah G1 ..... 3.45
Ind. Harbor, Ind. I-2, Y1 ..... 3.35
Irvin, Pa. C3 ..... 3.35
Lackawanna, N.Y. B2 ..... 3.35
Munhall, Pa. C3 ..... 3.35
Niles, O. N12 ..... 4.50
Pittsburg, Calif. C11 ..... 4.05
Pittsburgh J5 ..... 3.35
Sharon, Pa. S3 ..... 3.75
So. Chicago, Ill. W14 ..... 3.35
SparrowsPoint, Md. B2 ..... 3.35
Steubenville, O. W10 ..... 3.35
Torrance, Calif. C11 ..... 4.05
Warren, O. R2 ..... 3.35
Weirton, W. Va. W6 ..... 3.35
Youngstown C3, Y1 ..... 3.35

SHEETS, Hot-Rolled Carbon Steel (19 gage and lighter)
AlabamaCity, Ala. R2 ..... 4.50
Dover, O. R1 ..... 4.65
Ind. Harbor, Ind. I-2 ..... 4.40
Mansfield, O. E6 ..... 4.15
Niles, O. N12 ..... 5.00
Torrance, Calif. C11 ..... 5.15

SHEETS, H-R (14-ga., heavier) High-Strength Low-Alloy
Cleveland J5, R2 ..... 5.05
Conshohocken, Pa. A3 ..... 5.30
Ecorse, Mich. G5 ..... 5.50
Fairfield, Ala. T2 ..... 5.05
Fontana, Calif. K1 ..... 6.00
Gary, Ind. C3 ..... 5.05
Ind. Harbor, Ind. I-2 ..... 5.05
IndianaHarbor, Ind. Y1 ..... 5.30
Irvin, Pa. C3 ..... 5.05
Lackawanna (35) B2 ..... 5.05
Pittsburgh J5 ..... 5.05
Sharon, Pa. S3 ..... 5.40
So. Chicago, Ill. C3 ..... 5.05
SparrowsPoint (36) B2 ..... 5.05
Warren, O. R2 ..... 5.05
Weirton, W. Va. W6 ..... 5.30
Youngstown, C3 ..... 5.05
Youngstown, Y1 ..... 5.30

SHEETS, Cold-Rolled High-Strength Low-Alloy
Cleveland J5, R2 ..... 6.20
Ecorse, Mich. G5 ..... 6.65
Fontana, Calif. K1 ..... 7.05
Gary, Ind. C3 ..... 6.20
Ind. Harbor, Ind. I-2, ... 6.20
IndianaHarbor, Ind. Y1 .. 6.45
Irvin, Pa. C3 ..... 6.20
Lackawanna (37) B2 ..... 6.20
Pittsburgh J5 ..... 6.20
SparrowsPoint (38) B2 .. 6.20
Warren, O. R2 ..... 6.20
Weirton, W. Va. W6 ..... 6.45
Youngstown Y1 ..... 6.45

UNIVERSITY OF MICHIGAN LIBRARIES

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10	4.10
Cleveland J5, R2	4.10
Ecorse,Mich. G5	4.30
Fairfield,Ala. T2	4.10
Follansbee,W.Va. F4	5.10
Fontana,Calif. K1	5.00
Gary,Ind. C3	4.10
GraniteCity,Ill. G4	4.80
Ind.Harbor,Ind. I-2, Y1	4.10
Irvin,Pa. C3	4.10
Lackawanna,N.Y. B2	4.10
Middletown,O. A10	4.10
Pittsburg,Calif. C11	5.05
Pittsburgh J5	4.10
SparrowsPoint,Md. B2	4.10
Steubenville,O. W10	4.10
Wafren,O. R2	4.10
Weirton,W.Va. W6	4.10
Youngstown Y1	4.10

SHEETS, Galv'd No. 10 Steel

AlabamaCity,Ala. R2	4.40
Ashland,Ky.(8) A10	4.40
Canton,O. R2	4.40
Delphos,O. N16	5.40
Dover,O. R1	4.75
Fairfield,Ala. T2	4.40
Gary,Ind. C3	4.40
GraniteCity,Ill. G4	5.10
Ind.Harbor,Ind. I-2	4.40
Irvin,Pa. C3	4.40
Kokomo,Ind.(13) C16	4.80
MartinsFerry,O. W10	4.40
Niles,O. N12	5.50
Pittsburg,Calif. C11	5.15
SparrowsPoint,Md. B2	4.40
Steubenville,O. W10	4.40
Torrance,Calif. C11	5.15
Weirton,W.Va. W6	4.40

SHEETS, Galvanized No. 10, High-Strength Low Alloy

Irvin,Pa. C3	6.75
SparrowsPoint(39) B2	6.75

SHEETS, Galvannealed Steel

Canton,O. R2	4.95
Irvin,Pa. C3	4.95
Kokomo,Ind.(13) C16	5.35
Niles,O. N12	6.05

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. A10	4.65
Middletown,O. A10	4.65

SHEETS, Electro Galvanized

Cleveland R2 (28)	5.25
Niles,O. R2 (28)	5.25
Weirton,W.Va. W6	5.10

SHEETS, Zinc Alloy

Ind.Harbor,Ind. I-2	5.05

SHEETS, Long Terne, Steel (Commercial Quality)

BeechBottom,W.Va. W10	4.80
Gary,Ind. C3	4.80
Mansfield,O. E6	4.80
Middletown,O. A10	4.80
Niles,O. N12	5.30
Weirton,W.Va. W6	4.80

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.20

ROOFING SHORT TERNES (Package; 8 lb coated)

Gary,Ind. C3	$17.50
Yorkville,O. W10	17.50

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$6.45
Gary,Ind. C3	6.35
Irvin,Pa. C3	6.35
SparrowsPoint,Md. B2	6.45
Yorkville,O. W10	6.35

SHEETS, Lt. Coated Ternes, 6 lb

Yorkville,O. W10	$7.05

SHEETS, Mfg. Ternes, 8 lb

Gary,Ind. C3	$8.10
Warren,O. R2	8.10
Yorkville,O. W10	8.10

BLUED Stock, 29 Ga.

Yorkville,O. W10	6.00
Follansbee,W.Va.(23)F4	5.70

SHEETS, Culvert No. 16	**Cu Alloy**	**Cu Fe**
Ashland A10	5.20	...
Canton,O. R2	5.25	5.70
Fairfield,Ala. T2	5.20	5.45
Gary C3	5.20	5.45
IndianaHarbor I-2	5.20	5.45
Irvin,Pa. C3	5.20	5.45
Kokomo C16	5.80	...
MartinsFy,O. W10	5.20	5.45
Pittsburg,Cal. C11	5.95	...
SparrowsPt. B2	5.20	...
Torrance,Cal. C11	5.95	...

SHEETS, Culvert, No. 16 Corrugated Ingot iron

Ashland,Ky. A10	5.45
Fairfield,Ala. T2	5.45

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland(8) A10	3.60
Cleveland R2	3.95
Ind.Harbor,Ind. I-2	3.60
Warren,O. R2	3.95

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2	4.70
Middletown,O. A10	4.60
Warren,O. R2	4.70

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10	4.65
Canton,O. R2	5.15
Ind.Harbor,Ind. I-2	4.80

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	4.90
Middletown,O. A10	4.90

SHEETS, Wrought Iron	**An'l**	**Galv.**
Apollo,Pa. B14	12.60	16.85

SHEETS, Drum Body

Pittsburg,Calif. C11	4.05
Torrance,Calif. C11	4.05

SHEETS, ALUMINIZED

Butler,Pa. A10	7.75

SHEETS, Well Casing

Fontana,Calif. K1	4.80

TIN PLATE, Electrolytic (Base Box)	**0.25 lb**	**0.50 lb**	**0.75 lb**
Aliquippa,Pa. J5	$6.35	$6.60	$6.85
Fairfield,Ala. T2	6.45	6.70	6.95
Gary,Ind. C3	6.35	6.60	6.85
GraniteCity,Ill. G4	6.55	6.80	7.05
Ind.Harbor,Ind. I-2, Y1	6.35	6.60	6.85
Irvin,Pa. C3	6.35	6.60	6.85
Niles,O. R2	6.35	6.60	6.85
Pittsburg,Calif. C11	7.10	7.35	7.60
SparrowsPoint,Md. B2	6.45	6.70	6.95
Weirton,W.Va. W6	6.35	6.60	6.85
Yorkville,O. W10	6.35	6.60	6.85

SHEETS, SILICON, H.R. or C.R.(22 Ga.) COILS (Cut Lengths ½c lower)	**Field**	**Armature**	**Electric**	**Motor**	**Dynamo**
BeechBottom W10(cut lengths)	...	...	6.70	7.95	8.75
Brackenridge,Pa. A4	...	...	7.20	8.45	9.25
GraniteCity,Ill.G4(cut lengths)	...	...	7.40	8.65	...
Ind.Harbor,Ind. I-2	6.40	6.70	(34)	...	...
Mansfield,O. E6 (cut lengths)	5.90	6.20	6.70	7.95	8.75
Niles,O. N12 (cut lengths)	...	6.50	7.00	...	...
Vandergrift,Pa. C3	...	6.70	7.20	8.45	9.25
Warren,O. R2	6.40	6.70	7.20	8.45	9.25
Zanesville,O. A10	...	6.70	7.20	8.45	9.25

SHEETS, SILICON (22 Ga. Base) Coils (Cut Lengths ½c lower)

Transformer Grade	**72**	**65**	**58**	**52**
BeechBottom W10 (cut lengths)	9.30	9.85	10.55	11.35
Brackenridge,Pa. A4	9.80	10.35	11.05	...
Vandergrift,Pa. C3	9.80	10.35	11.05	11.85
Warren,O. R2	9.80	...	...	...
Zanesville,O. A10	9.80	10.35	11.05	11.85

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)	**T-100**	**T-90**	**T-80**	**T-73**
Butler,Pa. A10 (C.R.)	...	...	14.20	14.70
Vandergrift,Pa. C3	12.35	13.20	14.20	14.70

TIN PLATE, American COKE (Base Box)	**1.25 lb**	**1.50 lb**
Aliquippa J5	$7.30	$7.50
Fairfield,Ala. T2, Y1	7.40	7.60
Gary C3	7.30	7.50
Ind.Harbor I-2, Y1	7.30	7.50
Irvin,Pa. C3	7.30	7.50
Pitts.Cal. C11	8.05	8.25
Sp.Pt.,Md. B2	7.40	7.60
Warren R2	7.30	7.50
Weirton W6	7.30	7.50
Yorkville,O. W10	7.30	7.50

CANMAKING BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$5.60
Fairfield,Ala. T2	5.70
Gary,Ind. C3	5.60
GraniteCity,Ill. G4	5.80
Ind.Harbor,Ind. I-2, Y1	5.60
Irvin,Pa. C3	5.60
Niles,O. R2	5.60
Pittsburg,Calif. C11	6.35
SparrowsPoint,Md. B2	5.70
Warren,O. R2	5.60
Weirton,W.Va. W6	5.60
Yorkville,O. W10	5.60

HOLLOWARE ENAMELING Black Plate (29 gage)

Aliquippa,Pa. J5	5.30
Follansbee,W.Va. F4	5.30
Gary,Ind. C3	5.30
GraniteCity,Ill. G4	5.50
Ind.Harbor,Ind. Y1	5.30
Irvin,Pa. C3	5.30
Niles,O. R2	5.75
SparrowsPoint,Md. B2	5.40
Warren,O. R2	5.30
Yorkville,O. W10	5.30

SHEETS, Enameling Iron

Ashland,Ky.(8) A10	4.40
Cleveland R2	4.40
Ecorse,Mich. G5	4.70
Gary,Ind. C3	4.40
GraniteCity,Ill. G4	5.10
Ind.Harbor,Ind. I-2	4.40
Irvin,Pa. C3	4.40
Middletown,O. A10	4.40
Youngstown Y1	4.40

STRIP, Hot-Rolled, High-Strength Low-Alloy

Atlanta(9) A11	5.10
Bessemer,Ala. T2	4.95
Conshohocken,Pa. A3	*5.20*
Ecorse,Mich. G5	5.40
Fairfield,Ala. T2	4.95
Fontana,Cal. K1	5.90
Gary,Ind. C3	4.95
Ind.Harb.,Ind. I-2	4.95
IndianaHarbor,Ind. Y1	5.20
Lackawanna,N.Y. B2	4.95
LosAngeles(25) B3	5.70
Sharon,Pa. S3	5.30
So.SanFrancisco(25) B3	5.70
SparrowsPoint,Md. B2	4.95
Warren,O. R2	4.95
Weirton,W.Va. W6	5.20
Youngstown Y1	5.20
Youngstown C3	4.95

STRIP, Hot-Rolled Alloy

Bridgeprt,Conn.(10) S15	*5.45*
Carnegie,Pa. S18	5.45
Fontana,Calif. K1	6.30
Gary,Ind. C3	5.10
Houston,Tex. S5	5.50
KansasCity,Mo. S5	5.70
NewBritn,Conn.(10) S15	*5.45*
Sharon,Pa. S3	5.45
Youngstown C3	5.10

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	3.50
Warren,O. R2	3.85

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	3.25
Alton,Ill.(1) L1	3.25
Ashland,Ky.(8) A10	3.25
Atlanta A11	3.80
Bessemer,Ala. T2	3.25
Bridgeprt,Conn.(10) S15	3.75
Buffalo(27) R2	3.25
Butler,Pa. A10	3.25
Carnegie,Pa. S18	3.75
Conshohocken,Pa. A3	3.50
Detroit M1	4.05
Ecorse,Mich. G5	3.45
Fairfield,Ala. T2	3.25
Fontana,Calif. K1	4.40
Gary,Ind. C3	3.25
Houston, Tex. S5	3.65
Ind.Harbor,Ind. I-2, Y1	3.25
KansasCity,Mo.(9) S5	3.85
Lackawanna,N.Y. B2	3.25
LosAngeles B3	4.00
Milton,Pa. B6	3.50
Minnequa,Colo. C10	4.30
NewBritain(10) S15	3.75
N.Tonawanda,N.Y. B11	3.25
Pittsburg,Calif. C11	4.00
Riverdale,Ill. A1	3.25
SanFrancisco S7	4.00
Seattle B3, N14	4.25
Sharon,Pa. S3	3.75
So.Chicago,Ill. W14	3.25
So.SanFrancisco B3	4.00
SparrowsPoint,Md. B2	3.25
Torrance,Calif. C11	4.00
Warren,O. R2	3.25
Weirton,W.Va. W6	3.25
WestLeechburg,Pa. A4	3.50
Youngstown C3, Y1	3.25

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn.(10) S15	*10.10*
Carnegie,Pa. S18	10.10
Cleveland A7	9.50
Dover, O. G6	10.00
Fontana,Calif. K1	11.15
Harrison,N.J. C18	10.00
NewBritn.Conn.(10) S15	*10.10*
Pawtucket,R.I.(11) N8	9.50
Pawtucket,R.I.(12) N8	9.80
Sharon,Pa. S3	10.10
Worcester,Mass. A7	9.80
Youngstown C8	9.50

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	4.75

STRIP, Cold-Finished, Spring Steel (Annealed)	**0.26-0.40C**	**0.41-0.60C**	**0.61 0.80C**	**0.81-1.05C**	**1.06-1.35C**
Bridgeport,Conn.(10) S15	4.85	6.30	6.90	8.85	11.15
Bristol,Conn. W1	...	...	6.85	8.80	...
Carnegie,Pa. S18	...	6.30	6.90	8.85	11.15
Cleveland A7	4.15	5.95	6.55	8.50	10.80
Detroit D2	*5.10*	*6.15*	*6.75*	...	...
Detroit(21) D2	*5.35*	*6.25*	*6.85*	...	...
Dover,O. G6	5.00	6.30	6.90	8.85	11.15
FranklinPark,Ill. T6	4.50	6.10	6.70	8.65	...
Harrison,N.J. C18	...	...	6.85	8.80	11.10
Mattapan,Mass. T6	4.65	6.25	6.85	8.80	11.10
NewBritn.,Conn.(10) S15	4.85	6.30	6.90	8.85	11.15
NewCastle,Pa. B4	4.85	6.30	6.90	8.85	...
NewCastle,Pa. E5	*5.00*	*6.30*	*6.90*	*8.85*	*11.15*
NewYork W3	...	6.30	6.90	8.85	11.15
Pawtucket,R.I. N8:					
Cleve-or-Pitts.Base	4.70	5.95	6.55	8.50	10.80
Worcester,Base	4.65	6.25	6.85	8.80	11.10
Sharon,Pa. S3	4.85	6.30	6.90	8.85	11.15
Trenton,N.J. R5	...	6.25	6.85	8.80	11.10
Wallingford,Conn. W2	4.65	6.25	6.85	8.80	11.10
Weirton,W.Va. W6	4.15	5.95	6.55	8.50	10.80
Worcester,Mass. A7	4.45	6.25	6.85	8.80	11.10
Worcester,Mass. T6	4.65	6.25	6.85	8.80	11.10
Youngstown C8	4.15	5.95	6.55	8.50	10.80
Spring Steel (Tempered)					
Trenton,N.J. R5	...	...	9.30	11.25	13.85
Harrison,N.J. C18	...	...	9.30	11.25	13.85

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6	5.00
Berea,O. C7	6.60
Bridgeprt,Conn.(10) S15	4.85
Butler,Pa. A10	4.15
Cleveland A7, J5	4.15
Dearborn,Mich. D3	*5.10*
Detroit D2	*5.10*
Detroit M1	4.95
Dover,O. (40) G6	5.00
Ecorse,Mich. G5	4.35
Follansbee,W.Va. F4	4.85
Fontana,Calif. K1	5.75
FranklinPark,Ill. T6	4.50
Ind.Harbor,Ind. I-2	4.30
Lackawanna,N.Y. B2	4.15
LosAngeles C1	5.85
Mattapan,Mass. T6	5.00
Middletown,O. A10	4.15
NewBritain(10) S15	4.85
NewCastle,Pa. B4	4.85
NewCastle,Pa.(40) E5	*4.75*
NewHaven,Conn. D2	*5.35*
NewHaven,Conn. A7	4.60
New York W3	5.00
Pawtucket,R.I. R3	5.15
Pawtucket,R.I.(21) N8	5.00
Riverdale,Ill. A1	4.50
Rome,N.Y. R6	4.15
Sharon,Pa. S3	4.85
SparrowsPoint,Md. B2	4.15
Trenton,N.J. R5	5.50
Wallingford,Conn. W2	5.00
Warren,O.(40) T5	4.75
Warren,O. R2	4.15
Weirton,W.Va. W6	4.15
Youngstown C8, (40)	4.50
Youngstown Y1	4.15

STRIP, Cold-Rolled, High-Strength Low-Alloy

Cleveland A7, J5	6.20
Dover,O. G6	6.80
Ecorse,Mich. G5	6.65
Fontana,Calif. K1	6.95
Lackawanna,N.Y. B2	6.40
Sharon,Pa. S3	6.55
SparrowsPoint,Md. B2	6.40
Warren,O. R2	6.20
Weirton,W.Va. W6	6.45
Youngstown Y1	6.45

STRIP, Electro Galvanized

Dover,O. G6	5.00
Weirton,W.Va. W6	4.15
Youngstown C8	4.15
Warren,O. T5	4.75

Key to Producing Companies

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.

B1 Babcock & Wilcox Tube
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Boiardi Steel Corp.
B8 Braeburn Alloy Steel
B11 Buffalo Bolt Co.
B14 A.M. Byers Co.

C1 Calif. Cold Rolled Steel
C2 Calumet Steel Div., Borg-Warner Corp.
C3 Carnegie-Illinois Steel
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve.Cold.Roll.Mills Co.
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia Steel Co.
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Steel
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
G1 Geneva Steel Co.
G2 Globe Iron Co.
G3 Globe Steel Tubes Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H4 Heppenstall Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K5 Kidd Drawn Steel Co.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Electric Steel
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

TIGHT COOPERAGE HOOP

Atlanta A11	3.80
Riverdale,Ill. A1	3.40
Sharon,Pa. S3	3.90
Youngstown C3	3.40

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	5.90
Alton,Ill. (1) L1	5.90
Bartonville,Ill. (1) K4	5.90
Buffalo W12	5.90
Cleveland A7	5.90
Donora,Pa. A7	5.90
Duluth A7	5.90
Fostoria,O. S1	6.20
Johnstown,Pa. B2	5.90
Los Angeles B3	6.85
Millbury,Mass.(12) N6	6.20
Monessen,Pa. P7, P16	5.90
Palmer,Mass. W12	6.20
Pittsburg,Calif. C11	6.85
Portsmouth,O. P12	5.90
Roebling,N.J. R5	6.20
So.Chicago,Ill. R2	5.90
SparrowsPoint,Md. B2	6.00
Struthers,O. Y1	5.90
Trenton,N.J. A7	6.20
Waukegan,Ill. A7	5.90
Williamsport,Pa. B2	6.00
Worcester A7,J4,T6,W12	6.20
Worcester,Mass. N6	6.20

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	5.70
Buffalo W12	5.35
Cleveland A7	5.35
Crawfordsville,Ind. MS	5.35
Dover,O. G6	5.70
Fostoria,O. S1	6.00
Kokomo,Ind. C16	5.35
FranklinPark,Ill. T6	5.70
Massillon,O. R8	5.35
Monessen,Pa. P16	5.35
Monessen,Pa. P7	5.60
Pawtucket,R.I.(12) N8	6.00
Trenton,N.J. R5	5.65
Worcester A7, T6, W12	5.65

WIRE, Fine and Weaving (8-in. Coils)

Bartonville,Ill.(1) K4	8.45
Buffalo W12	8.45
Chicago W13	8.45
Cleveland A7	8.45
Crawfordsville,Ind. MS	8.45
Fostoria,O. S1	8.90
Johnstown,Pa. B2	8.45
Kokomo,Ind. C16	8.45
Monessen,Pa. P16	8.45
Palmer,Mass. W12	8.75
Portsmouth,O. P12	8.45
Roebling,N.J. R5	8.75
Waukegan,Ill. A7	8.45
Worcester,Mass. A7, T6	8.75

WIRE, Tire Bead

Bartonville,Ill.(1) K4	10.55
Monessen,Pa. P16	10.80
Roebling,N.J. R5	10.80

WIRE, Manufacturers Bright, Low-Carbon

AlabamaCity,Ala. R2	4.50
Aliquippa,Pa. J5	4.50
Atlanta A11	4.85
Alton,Ill.(1) L1	4.50
Bartonville,Ill.(1) K4	4.50
Buffalo W12	4.50
Chicago W13	4.50
Cleveland A7, C20, R2	4.50
Crawfordsville,Ind. MS	4.60
Donora,Pa. A7	4.50
Duluth A7	4.50
Fairfield,Ala. T2	4.50
Fostoria,O. (24) S1	5.00
Houston S5	4.90
Johnstown,Pa. B2	4.50
Joliet,Ill. A7	4.50
KansasCity,Mo. S5	5.10
Kokomo,Ind. C16	4.85
Los Angeles B3	5.45
Minnequa,Colo. C10	4.75
Monessen,Pa. P7	4.75
Newark, 6-8ga. I-1	5.15
No. Tonawanda B11	4.60
Palmer,Mass. W12	4.80
Pittsburg,Calif. C11	5.45
Portsmouth,O. P12	4.50
Rankin,Pa. A7	4.50
So.Chicago,Ill. R2	4.50
So.SanFrancisco C10	5.45
SparrowsPoint,Md. B2	4.60
Sterling,Ill.(1) N15	4.80
Struthers,O. Y1	4.50
Torrance,Calif. C11	5.45
Waukegan,Ill. A7	4.50
Worcester,Mass. A7	4.80
Worcester,Mass. T6	4.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5	5.55
Alton,Ill.(1) L1	5.55
Buffalo W12	5.55
Cleveland A7	5.55
Donora,Pa. A7	5.55
Duluth A7	5.55
Johnstown,Pa. B2	5.55
LosAngeles B3	6.50
Monessen,Pa. P7, P16	5.55
NewHaven,Conn. A7	5.85
Palmer,Mass. W12	5.55
Pittsburg,Calif. C11	6.50
Portsmouth,O. P12	5.55
Roebling,N.J. R5	5.85
So.Chicago,Ill. R2	5.55
SparrowsPoint,Md. B2	5.65
Torrance,Calif. C11	6.50
Trenton,N.J. A7	5.85
Waukegan,Ill. A7	5.55
Worcester,Mass. A7	5.85

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4	8.15
Monessen,Pa. P16	8.15
Roebling,N.J. R5	8.45
SparrowsPoint,Md. B2	8.25

WIRE, Merchant Quality (6 to 8 gage)

	An'ld	Galv.
AlabamaCity R2	5.35	5.60
Aliquippa J5	5.35	5.80
Atlanta A11	5.70	5.95
Bartonville(19) K4	5.35	5.80
Buffalo(31) W12	4.50	...
Cleveland A7	*5.35*	*5.50*
Crawfordsvil. MS	5.45	5.95
Donora A7	*5.35*	*5.50*
Duluth A7	*5.35*	*5.50*
Fairfield T2	*5.35*	*5.50*
Houston,Tex. S5	5.75	6.00
Johnstown B2	*5.35**	*5.80*
Joliet,Ill. A7	*5.35*	*5.50*
KansasCy.Mo. S5	5.95	6.20
Kokomo C16	5.70	5.95
LosAngeles B3	6.30	...
Minnequa C10	5.60	6.10
Monessen P7	5.60	5.85
Palmer(31) W12	4.80	...
Pitts.,Cal. C11	*6.30*	*6.45*
Prtsmth.(18) P12	5.35	5.60
Rankin A7	*5.35*	*5.50*
So.Chicago R2	5.35	5.60
So.S.Fran. C10	6.30	6.80
SparrowsPt. B2	*5.45**	*5.90*
Sterling,Ill.(1)N15	5.65	5.85
Struthers,O. Y1	5.35	5.60
Torrance,Cal. C11	6.30	...
Worcester A7	*5.65*	*5.80*

* Unchanged.

WIRE (16 gage)	An'ld Stone	Galv. Stone
Aliquippa J5	9.80	11.50
Bartonville(1) K4	9.80	11.50
Cleveland A7	*9.80*	*11.20*
Crawfrdvil. MS	9.80	11.30
Fostoria,O. S1	10.40	12.40
Johnstown B2	9.80	11.30
Kokomo C16	9.80	11.30
Minnequa C10	10.05	12.05
Palmer,Mass. W12	9.80	11.30
Pitts.,Cal. C11	*10.15*	*11.55*
Prtsmth.(18) P12	9.80	11.30
SparrowsPt. B2	9.90	11.40
Waukegan A7	*9.80*	*11.20*

WIRE, Barbed

AlabamaCity,Ala. R2	126
Aliquippa,Pa. J5	130
Atlanta A11	133
Bartonville,Ill.(19) K4	126
Crawfordsville MS	135
Donora,Pa. A7	*124*
Duluth,Minn. A7	*124*
Fairfield,Ala. T2	*124*
Houston,Tex. S5	134
Johnstown,Pa. B2	*130*
Joliet,Ill. A7	*124*
KansasCity,Mo. S5	138
Kokomo,Ind. C16	135
Minnequa,Colo. C10	136
Monessen,Pa. P7	133
Pittsburg,Calif. C11	*144*
Portsmouth,O.(18) P12	126
Rankin,Pa. A7	*124*
So.Chicago,Ill. R2	126
So.SanFran.,Calif. C10	151
SparrowsPoint,Md. B2	*132*
Sterling,Ill.(1) N15	133

FENCE POSTS

	Col.
ChicagoHts.,Ill. C2	125
Duluth A7	116
Franklin,Pa. F5	125
Huntington,W.Va. W7	125
Johnstown,Pa. B2	125
Joliet,Ill. A7	116
Marion,O. P11	125
Minnequa,Colo. C10	121
Moline,Ill. R2	112
So.Chicago R2	116
Williamsport,Pa. S19	130

WOVEN FENCE, 9-15½ Ga. Col.

AlabamaCity,Ala. R2	116
Ala.City,Ala.,17-18ga.R2	198
Aliquippa,Pa.9-14½ga.J5	120
Atlanta A11	123
Bartonville,Ill.(19) K4	116
Crawfordsville,Ind. MS	123
Donora,Pa. A7	*114*
Duluth A7	120
Houston,Tex. S5	124
Fairfield,Ala. T2	*114*
Johnstown,Pa. B2	*120*
Johnstn,17ga.6" B2	*194*
Johnstn,17ga.,4" B2	*197*
Joliet,Ill. A7	*114*
KansasCity,Mo. S5	128
Kokomo,Ind. C16	123
Minnequa,Colo. C10	128
Monessen,Pa. P7	123
Pittsburg,Calif. C11	*137*
Portsmouth,O.(18) P12	116
Rankin,Pa. A7	*114*
So.Chicago,Ill. R2	116
Sterling,Ill.(1) N15	118

BALE TIES, Single Loop Col.

AlabamaCity,Ala. R2	113
Atlanta A11	119
Bartonville,Ill.(19) K4	113
Chicago W13	113
Crawfordsville MS	120
Donora,Pa. A7	113
Duluth A7	113
Fairfield,Ala. T2	113
Joliet,Ill. A7	113
KansasCity,Mo. S5	125
Kokomo,Ind. C16	120
Minnequa,Colo. C10	118
Pittsburg,Calif. C11	137
So.Chicago,Ill. R2	113
So.SanFran.,Calif. C10	137
SparrowsPoint,Md. B2	115
Sterling,Ill.(1) N15	119

AXLES

Ind.Harbor,Ind. S13	5.25
Johnstown,Pa. B2	5.25

JOINT BARS

Bessemer,Pa. C3	4.40
Fairfield,Ala. T2	4.40
Ind.Harbor,Ind. I-2	4.40
Joliet,Ill. C3	4.40
Lackawanna,N.Y. B2	4.40
Minnequa,Colo. C10	4.40
Steelton,Pa. B2	4.40

STANDARD TRACK SPIKES

Ind.Harbor,Ind. I-2, Y1	5.60
KansasCity,Mo. S5	5.85
Lebanon,Pa. B2	5.60
Minnequa,Colo. C10	5.60
Pittsburgh J5	5.60
Seattle B3	6.10
So.Chicago,Ill. R2	5.60
Struthers,O. Y1	5.60
Youngstown R2	5.60

NAILS & STAPLES, Stock To dealers & mfrs. (7) Col.

AlabamaCity,Ala. R2	106
Aliquippa,Pa. (13) J5	106
Atlanta A11	113
Bartonville,Ill.(19) K4	106
Chicago,Ill. W13	106
Cleveland A9	111
Crawfordsville,Ind. MS	112
Donora,Pa. A7	106
Duluth A7	106
Fairfield,Ala. T2	106
Galveston,Tex. D7	114
Houston,Tex. S5	114
Johnstown,Pa. B2	106
Joliet,Ill. A7	106
KansasCity, Mo. S5	118
Kokomo,Ind. C16	112
Minnequa,Colo. C10	111
Monessen,Pa. P7	112
Pittsburg,Calif. C11	125
Portsmouth,O. P12	106
Rankin,Pa. A7	106
So.Chicago,Ill. R2	106
SparrowsPoint,Md. B2	108
Sterling,Ill.(1) N15	112
Torrance,Calif. C11	126
Worcester,Mass. A7	112

NAILS & STAPLES, Non-Stock

AlabamaCity,Ala. R2	5.35
Bartonville,Ill.(19) K4	5.35
Crawfordsville,Ind. MS	5.90
Donora,Pa. A7	5.35
Duluth A7	5.35
Johnstown,Pa. B2	5.35
Joliet,Ill. A7	5.35
Kokomo,Ind. C16	5.65
Minnequa,Colo. C10	5.60
Pittsburg,Calif. C11	6.30
Portsmouth,O. P12	5.35
Rankin,Pa. A7	5.35
So.Chicago,Ill. R2	5.35
SparrowsPoint,Md. B2	5.45
Sterling,Ill.(1) N15	5.65
Worcester,Mass. A7	5.65

NAILS, Cut (100 lb keg) To dealers (33)

Conshohocken,Pa. A3	$6.75
Wheeling,W.Va. W10	6.75

TIE PLATES

Fairfield,Ala. T2	4.20
Gary,Ind. C3	4.20
Ind.Harbor,Ind. I-2	4.20
Lackawanna,N.Y. B2	4.20
Minnequa,Colo. C10	4.20
Pittsburg,Calif. C11	4.35
Seattle B3	4.35
Steelton,Pa. B2	4.20
Torrance,Calif. C11	4.35
Weirton,W.Va. W6	4.20

TRACK BOLTS (20) Treated

KansasCity,Mo. S5	9.10
Lebanon,Pa.(32) B2	8.85
Minnequa,Colo. C10	9.10
Pittsburgh O3, P14	9.10
Seattle B3	9.35

ROPE WIRE	Mild Plow	Plow	Imp. Plow
Bartonville,Ill. K4	8.05	8.05	8.30
Buffalo W12	8.05	8.05	8.30
Cleveland A7	8.05	8.05	8.30
Donora,Pa. A7	8.05	8.05	8.30
Fostoria,O. S1	8.35	8.35	8.60
Johnstown,Pa. B2	8.05	8.05	8.30
Monessen,Pa. P16	8.05	8.05	8.30
Monessen,Pa. P7	8.30	8.30	8.55
NewHaven,Conn. A7	8.35	8.35	8.60
Palmer,Mass. W12	8.35	8.35	8.60
Portsmouth,O. P12	8.05	8.05	8.30
Roebling,N.J. R5	8.35	8.35	8.60
SparrowsPoint,Md. B2	8.15	8.15	8.40
Struthers,O. Y1	8.05	8.05	8.30
Trenton,N.J. A7	8.35	8.35	8.60
Waukegan,Ill. A7	8.05	8.05	8.30
Williampsort,Pa. B2	8.15	8.15	8.40
Worcester,Mass. J4, T6	8.35	8.35	8.60

RAILS	Std. No. 1	Std. No. 2	Std. All No. 2	TeeRails 60 lb Under
Bessemer,Pa. C3	3.40	3.30	3.35	3.75
Ensley,Ala. T2	3.40	3.30	...	3.75
Fairfield,Ala. T2	...	...	...	3.75
Gary,Ind. C3	3.40	3.30	3.35	...
Huntington,W.Va. W7	...	...	...	3.75
Ind.Harbor,Ind. I-2	3.40	3.30	3.35	...
Johnstown,Pa. B2	...	...	...(16)	3.75
Lackawanna B2	3.40	3.30	...	3.75
Minnequa,Colo. C10	3.40	3.30	...	4.25
Steelton,Pa. B2	3.40	3.30	...	...
Williamsport,Pa. S19	...	...	...	*4.25*

TOOL STEELS

Grade	Cents per lb	Grade	Cents per lb
Reg. Carbon	21.00	18W,4Cr,3V	126.00
Extra Carbon	24.50	18'V,4Cr,2V,9Co	185.50
Spec. Carbon	29.50-31.50	18W,4Cr,2V,6Co	169.50
Oil Hardening	32.00	18.25W,4.25Cr,1V,4.75Co	156.50
Cr Hot Wrk.	32.00	20.25W,4.25Cr,1.6V,12.25Co	293.50
Hi-Carbon-Cr	57.50	1.5W,4Cr,1V,8.5Mo	71.50
18W,4Cr,1V	100.00	6.4W,4.5Cr,1.9V,5Mo	76.50
18W,4Cr,2V	113.00	6W,4Cr,3V, 6Mo	97.00

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, H4, J3, L3, M14, S8, T7, U4, V2, V3.

Key to Producing Companies

M1	McLouth Steel Corp.
M4	Mahoning Valley Steel
M5	Medart Co.
M6	Mercer Tube & Mfg. Co.
M8	Mid-States Steel & Wire
M9	Midvale Co.
M10	Missouri-Illinois Furnace
M12	Moltrup Steel Products
M13	Monarch Steel Co.
M14	McInnes Steel Co.
N2	National Supply Co.
N3	National Tube Co.
N5	Nelson Steel & Wire Co.
N6	New Eng. HighCarb.Wire
N8	Newman-Crosby Steel
N12	Niles Rolling Mill Co.
N14	Nrthwst.Steel Roll. Mills
N15	Northwestern S.&W. Co.
N16	New Delphos Mfg. Co.
03	Oliver Iron & Steel Corp.
04	Oregon Steel Mills
P1	Pacific States Steel Corp.
P2	Pacific Tube Co.
P4	Phoenix Iron & Steel Co.
P5	Pilgrim Drawn Steel
P6	Pittsburgh Coke&Chem.
P7	Pittsburgh Steel Co.
P9	Pittsburgh Tube Co.
P11	Pollak Steel Co.
P12	Portsmouth Division, Detroit Steel Corp.
P13	Precision Drawn Steel
P14	Pits.Screw & Bolt Co.
P15	Pittsburgh Metallurgical
P16	Page Steel & Wire Div., Amer. Chain & Cable
P17	Plymouth Steel Co.
R1	Reeves Steel & Mfg. Co.
R2	Republic Steel Corp.
R3	Rhode Island Steel Corp.
R5	Roebling's Sons, John A.
R6	Rome Strip Steel Co.
R7	Rotary Electric Steel Co.
R8	RellanceDiv.,EatonMfg.
S1	Senaca Wire & Mfg. Co.
S3	Sharon Steel Corp.
S5	Sheffield Steel Corp.
S6	Shenango Furnace Co.
S7	Simmons Co.
S8	Simonds Saw & Steel Co.
S9	Sloss-Sheffield,S.&.I. Co.
S13	Standard Forgings Corp.
S14	Standard Tube Co.
S15	Stanley Works
S16	Struthers Iron & Steel
S17	Superior Drawn Steel Co.
S18	Superior Steel Corp.
S19	Sweet's Steel Co.
S20	Southern States Steel
T2	Tenn.Coal, Iron & R.R.
T3	Tenn.Prod. & Chem.
T4	Texas Steel Co.
T5	Thomas Steel Co.
T6	Thompson Wire Co.
T7	Timken Roller Bearing
T9	Tonawanda Iron Div. Am. Rad. & Stan. San.
U1	Ulster Iron Works
U4	Universal Cyclops Steel
V2	Vanadium Alloys Steel
V3	Vulcan.Crucible Steel Co.
W1	Wallace Barnes Co.
W2	Wallingford Steel Co.
W3	Washburn Wire Co.
W4	Washington Steel Corp.
W6	Weirton Steel Co.
W7	W. Va. Steel & Mfg. Co.
W8	West.Auto.Mach.Screw
W9	Wheatland Tube Co.
W10	Wheeling Steel Corp.
W12	Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13	Wilson Steel &Wire Co.
W14	Wisconsin Steel Div. International Harvester
W15	Woodward Iron Co.
W16	Worth Steel Co.
W18	Wyckoff Steel Co.
Y1	Youngstown Sheet&Tube

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant. (4) Reinforcing.
(5) Philadelphia del.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pittsburgh base.
(12) Worcester, Mass. base.
(13) Add 0.50c for 17 Ga & heavier.
(14) Also wide flange beams.
(15) ¼" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pittsburgh base.
(20) Deduct 0.25c for untreated.
(21) New Haven, Conn. base.
(22) Del. San Fran. Bay area.
(23) 14 gage.
(24) Deduct 0.20c for finer than 15 gage.
(25) Bar mill bands.
(26) Reinforcing, to fabricators (⅝" bar elec. furn. billet, 5.03c); to consumers, 5.28c.
(27) Bar mill sizes.
(28) Bonderized.
(31) Not annealed.
(32) Untreated.
(33) To jobbers, deduct 20 cents.
(34) 6.70c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 15 gage & lighter; 60" & narrower.
(38) 14 gage & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.

UNIVERSITY OF MICHIGAN LIBRARIES

STANDARD PIPE, T. & C.

BUTTWELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % —Black— A	B	C	—Galvanized— D	E	F
⅛	5.5c	0.24	36.5	34.5	33.5	4.0	2.0	4.0
¼	6.0	0.42	33.5	31.5	30.5	4.0	2.0	5.0
⅜	6.0	0.57	29.0	27.0	26.0	+1.5	+3.5	0.5
½	8.5	0.85	40.5	38.5	39.5	18.5	16.5	18.5
¾	11.5	1.13	43.5	41.5	42.5	22.5	20.5	21.5
1	17.0	1.68	46.0	44.0	45.0	26.0	24.0	25.0
1¼	23.0	2.28	46.5	44.5	45.5	26.5	24.5	25.5
1½	27.5	2.73	47.0	45.0	46.0	27.5	25.5	26.5
2	37.0	3.68	47.5	45.5	46.5	28.0	26.0	27.0
2½	58.5	5.82	48.0	46.0	47.0	28.5	26.5	27.5
3	76.5	7.62	48.0	46.0	47.0	28.5	26.5	27.5

Column A: Etna, Pa. N2; Monaca, Pa. P9; Sharon, Pa. M6; Butler, Pa. ⅛-⅜", F6; Benwood, W. Va., 1½ percentage points lower on ⅛", 2 points lower on ¼", 3 points lower on ⅜", W10, Wheatland, Pa., 2 points lower on ⅛" through ⅜", W9. Following make ½" and larger: Lorain, O. N3; Youngstown, plus 43% on 3½" and 4", R2; Youngstown Y1; Aliquippa, Pa. J5. Fontana, Calif. K1 quotes 11 points lower on ⅛" and larger continuous weld and 31% on 3½" and 4".

Columns B & E: Sparrows Point, Md. B2.

Columns C & F: Indiana Harbor, Ind., ½" through 3", Y-1; Alton, Ill. (Lorain, O., base) L1.

Column D: Monaca, Pa. P9 quotes 1½ pts higher on ⅛" and ¼", 2 pts higher on ⅜", 1½ pts higher on ½" and ¾", 1 pt higher on 1" and 1¼", ½ pt higher on 1½" through 3"; Sharon, Pa. M6 quotes 1 pt lower on ⅛", 1½ pts higher on ¼", ½ pt higher on ⅜" and 1 pt lower on ½", ½ pt lower on ¾", 1½ pts lower on 1" and 1¼", 2 pts lower on 1½" through 3"; Butler, Pa. F6, ⅛" through ⅜"; Benwood, W. Va. W10 quotes 3 pts lower on ⅛", 2 pts lower on ¼", 3 pts lower on ⅜"; Wheatland, Pa. W9 quotes ½ pt lower on ⅛" and ¼", 2½ pts higher on ½" and ¾", 2 pts higher on 1" and 1¼", 1½ pts higher on 1½" through 3". Following quote only on ½" and larger: Lorain, O. N3; Youngstown R2, plus 23% on 3½" and 4"; Youngstown Y1; Aliquippa, Pa. J5 quotes 1 pt lower on ¾", 2 pts lower on 1", 1½ pts lower on 1¼", 2 pts lower on 1½" and 2", 1½ pts lower on 2½" and 3"; Etna, Pa. N2 plus 23% on 3½" and 4". Fontana, Calif. K1 quotes 11 pts lower on ½" and larger continuous weld and 11% on 3½" and 4".

SEAMLESS AND ELECTRIC WELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Seamless Black A	Seamless Galv. B	Elec. Weld Black C	Elec. Weld Galv. D
2	37.0c	3.68	36.0	17.5	36.0	17.5
2½	58.5	5.82	39.0	20.5	39.0	20.5
3	76.5	7.62	39.0	20.5	39.0	20.5
3½	92.0	9.20	41.0	22.5	41.0	22.5
4	$1.09	10.89	41.0	22.5	41.0	22.5
5	1.48	14.81	41.0	22.5	41.0	22.5
6	1.92	19.18	41.0	22.5	41.0	22.5

Column A: Aliquippa J5; Ambridge N2; Lorain N3; Youngstown Y1.

Column B: Aliquippa J5 quotes 3 pts lower on 2", 2½ pts lower on 2½-6 in.; Lorain, N3 quotes 1½ pts lower; Youngstown, Y1.

Columns C & D: Youngstown R2.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft. inclusive.

O.D. In.	B.W. Ga.	—Seamless— H.R.	C.D.	Elec. Weld H.R.	C.D.
1	13	12.36	14.39	13.96	13.96
1¼	13	14.63	17.05	14.19	16.54
1½	13	16.17	19.02	15.68	18.45
1¾	13	18.39	21.64	17.84	20.99
2	13	20.61	24.24	19.99	23.51
2¼	13	22.96	27.03	22.27	26.22
2¼	12	25.29	29.76	24.53	28.87
2½	12	27.71	32.58	26.88	31.60
2¾	12	29.36	34.53	28.48	33.49
3	12	30.82	36.27	29.90	35.18

CLAD STEELS

(Cents per pound)

Cladding Stainless	—Plates— Carbon Base 10%	20%	—Strip— Cold-Rolled Carbon Base 10%	Both Sides	—Sheets— Carbon Base 10%	20%	Cu Base Both Sides
302 ...	....	....	....	....	19.75	24.00	77.00
						24.00	
304 ...	23.50	26.50–28.00	....	....	20.75–23.50	24.00–25.50	77.00
309 ...	29.00	33.50	....	....	....	....	....
310 ...	35.00	39.50	....	....	....	....	144.00
316 ...	28.00	31.00–32 50	....	....	26.00	33.00–34.50	....
317 ...	33.00	37.50	....	....	....	....	....
318 ...	32.00	36.50	....	....	....	....	....
321 ...	25.00	29.50	....	....	23.00	25.00	111.00
347 ...	26.00	29.00–30.50	....	....	24.00	30.00–31.50	130.00
405 ...	19.75	26.25	....	....	....	....	....
410 ...	19.25	25.75	....	....	....	....	....
Nickel .	31.00	41.00	33.50	45.00	....	....	....
Inconel.	39.00	51.00	....	....	....	....	165.00
Monel .	32.00	42.00	....	....	....	....	....
Copper*	....	....	21.70†	27.65‡	....	....	....

* Deoxidized. † 18.20c for hot-rolled. ‡ 24.40c for hot-rolled. Production points for carbon base products: Stainless plates, sheet, Conshohocken, Pa. A3 and New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. W16, Coatesville, Pa. L7 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; nickel, monel, copper-clad strip, Carnegie, Pa., S18. Production point for copper-base sheets is Carnegie, Pa. A13.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants; per cent off list for less than case lots to consumers)

6 in. and shorter:
- ½-in. & smaller diam.. 23
- ⅝-in. & ⅝-in. 26
- ¾-in. and larger 26

Longer than 6 in.:
- All diams. 22

Lag bolts, all diams.:
- 6 in. and shorter 30
- over 6 in. long 28

Ribbed Necked Carriage. 26
Blank 40
Plow 40
Step, Elevator, Tap, and Sleigh Shoe 28
Tire bolts 20
Boiler & Fitting-Up bolts 37

NUTS

H.P. & C.P. Square:	Reg.	Heavy
½-in. & smaller	23	23
⅝-in. & ⅝-in..	20	15
¾-in.-1½-in. ..	23	10
1⅝ in. & larger	16	10
H.P. Hex.:		
½-in. & smaller	33	29
⅝-in. & ⅝-in..	24	15
¾-in.-1½-in. ..	20	11
1⅝ in. & larger	17	11
C.P. Hex.:		
½-in. & smaller	33	29
⅝-in. & ⅝-in..	30	25
¾-in. & 1½-in.	27	20
1⅝ in. & larger	20	15

SEMIFINISHED NUTS

American Standard
(Per cent off list for less than case or keg quantities)

	Hvy.	Reg.
½-in. & smaller ..	35	41
⅝-in. & ⅝-in. ...	29	36
¾-in.-1½-in.	23	31
1⅝-in. & larger ..	17	21
Light		
¼-in. & smaller		41
⅜-in. to ⅝-in.		35
¾-in. to 1½-in.		33

STEEL STOVE BOLTS

(F.o.b. plant; per cent off list in packages)

Plain finish .....56 & 10
Plated finishes .....41 & 10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:
- ⅝-in. & smaller 47
- ¾-in. through 1 in. ... 40

Longer than 6 in.:
- ⅝-in. & smaller 33
- ¾-in. through 1 in. ... 13

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam. x 6 in. and shorter 44
1 in. and smaller diam. x over 6 in. 33

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller 41
¼-in. diam. & larger .. 24
N.F. thread, all diams... 18

RIVETS

F.o.b. midwestern plants
Structural ½-in., larger 7.25c
⅞-in. under .....43 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers .....List to 50c off

ELECTRODES

(Threaded, with nipples, unboxed, f.o.b. plant)

Diam.	Length	Cents per lb
	GRAPHITE	
	—Inches—	
17,18,20	60,72	16.00
8 to 16	48,60,72	16.50
7	48,60	17.75
6	48,60	19.00
4.5⅛	40	19.50
3	40	20.50
2½	24,30	21.00
2	24,30	23.00
	CARBON	
40	100,110	7.50
35	100,110	7.50
30	84,110	7.50
24	72 to 104	7.50
17 to 20	34,90	7.50
14	60,72	8.00
10,12	60	8.25

STAINLESS STEEL

(Cents per pound)

Type	Sheets	C.R. Strip	Bars Wire Structurals
301...	39.00	32.00	30.00
302...	39.00	34.50	30.00
303...	41.00	38.00	32.50
304...	41.00	36.50	31.50
309...	53.50	52.50	43.00
316...	54.50	56.50	47.50
321...	47.00	46.00	35.50
347...	51.50	50.00	40.00
410...	34.50	28.50	24.50
416...	35.00	35.00	25.00
420...	42.00	45.00	30.00
430...	37.00	29.00	25.00
501...	25.50	24.00	13.00
502...	26.50	25.00	14.00

Baltimore, Types 301 through 347 sheet, except 309 E2.
Baltimore, bars, wire and structural A10.
Brackenridge, Pa., sheets A4.
Bridgeville, Pa., bars, wire, sheets & strip U4.
Butler, Pa., sheets and strip except Types 303, 309, 416, 420, 501 & 502 A10.
Carnegie, Pa., strip except Type 416, S18.
Cleveland, strip A7.
Detroit, strip, except Types 303, 309, 321, 416, 420, 501 and 502 M1.
Dunkirk, N.Y., bars, wire A4.
Duquesne, Pa., bars C3.
Fort Wayne, Ind., bars and wire, except Types 501 and 502 J6.
Gary, Ind., sheets except Type 416 C3.
Harrison, N. J., strip C18.
Harrison, N. J., Types 302, 304, 316 wire and strip D6.
Massillon, all products R2.
McKeesport, Pa., bars, sheets except Type 416 C3.
McKeesport, Pa., bars & wire except Types 301, 309, 501 & 502; strip Types 410 & 430 only F2.
Middletown, O., sheets except Types 303, 416, 420, 501 and 502 A10.
Midland, sheets & strip C18.
Munhall, Pa., bars C3.
Pittsburgh, sheets C18.
Reading, Pa., bars & strip C4.
Sharon, Pa., strip, except Types 303, 309, 316, 416, 501 and 502 S3.
So. Chicago, Ill., bars & structurals C3.
Syracuse, N. Y., bars, wire & structurals C18.
Titusville, Pa., bars, U4.
Wallingford, Conn., strip, except 309, W2 quotes 0.25 cents higher.
Washington, Pa., bars, sheets & strip, except Type 309 sheets 54.00c and bars 43.50c, J3.
Washington, Pa., Types 301 through 347 sheets & strip as listed except 303 & 309; 316 sheets 59.50c, strip 61.50c W4.
Watervliet, N. Y., structurals & bars A4.
Waukegan, bars & wire A7.
West Leechburg, Pa., strip, A4.
Youngstown, strip C8.

COAL, CHEMICALS

Spot, cents per gallon, ovens
Pure benzol 30.00-32.00
Toluol, one deg...21.00-28.00
Industrial xylol ..21.00-29.50
Per ton bulk, ovens
Sulphate of ammonia .$32-45
Cents per pound, ovens
Phenol, 40 (carlots, non-returnable drums) ..17.25
Do., less than carlots..18.00
Do., tank cars 15.50

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, corloads, effective CaF_2 content, 70% or more, $41; less than 60%, $38.
Imported, net ton, duty paid, metallurgical grade, $28-$29.

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted.)

Sponge iron Cents
- 98+% Fe, carlots.. 15.00
- Swedish, c.i.f. New York, in bags...7.40-8.50

Electrolytic Iron:
- Annealed, 99.5% Fe 39.50
- Unannealed, 99+% Fe 33.50
- Unannealed 99+% Fe(minus 325 mesh)48.50

Powder Flakes 44.50
Carbonyl Iron:
- 97.9-99.8%, size 5 to 10 microns..70.00-135.00

Aluminum:
- Carlots, freight allowed 27.00
- Atomized, 500 lb drums, freight allowed 30.00

Brass, 10-ton lots 30.00-33.25
Copper:
- Electrolytic 36.75
- Reduced 33.75-37.00

Lead 23.00
Manganese:
- Minus 100-mesh ... 52.00
- Minus 35 mesh ... 48.00
- Minus 200 mesh ... 56.00

Nickel unannealed .. 75.50
Nickel-Silver, 10-ton lots 43.25
Silicon 34.00
Solder (plus cost of metal) 8.50
Stainless Steel, 302 .. 75.00
Tin $1.30
Zinc, 10-ton lots .23.00-27.00
Tungsten: Dollars
- 99%, minus 80 to 200 mesh, freight allowed:
  - over 1000 lb 2.90
  - 1000 lb 2.95
  - less than 1000 lb. 3.00
- 98.8% minus 65 mesh, freight allowed:
  - 1000 lb and over.. 2.90
  - less than 1000 lb.. 3.00

Molybdenum:
- 99%, minus 80 to 200 mesh, over 500 lb 2.25
- 200 to 500 lb 2.60
- less than 200 lb .. 2.75
- 82-88%, freight allowed, 2000 lb and over .. 2.40
- less than 2000 lb.. 2.45

Chromium, electrolytic 99% Cr min. 3.50

METALLURGICAL COKE

Price per net ton

BEEHIVE OVENS

Connellsvll. fur. .$14.00-14.50
Connellsvll. fdry. .16.00-17.00
New River, foundry ..19.00
Wise county, foundry.15.95
Wise county, furnace..15.20

OVEN FOUNDRY COKE

Kearney, N. J., ovens .$22.75
Everett, Mass., ovens
- New England, del. †24.30

Chicago, ovens 21.00
- Chicago del. .....†22.45
- Detroit, del. 24.91

Terre Haute, ovens ...22.50
Milwaukee, ovens 23.00
Indianapolis, ovens ...22.00
- Chicago, del. 25.37
- Cincinnati, del. 24.92
- Detroit, del. 25.90

Ironton, O., ovens 21.50
- Cincinnati, del. 24.06

Painesville, O., ovens..23.25
- Buffalo, del. 25.37
- Cleveland, del. 24.97

Erie, Pa., ovens 22.50
Birmingham, ovens ...19.40
- Birmingham, del. ...20.45

Philadelphia, ovens ..22.10
Neville Island, Pa., ovens 22.00
Swedeland, Pa., ovens .22.00
St. Louis, ovens 22.99
- St. Louis, del. 24.12

Portsmouth, O., ovens..21.50
- Cincinnati, del. 24.06

Detroit, ovens 23.00
- Detroit, del. *24.00
- Buffalo, del. 26.04
- Flint, del. 25.44
- Pontiac, del. 24.39
- Saginaw, del. 25.75

Includes representative switching charge of: *, $1.00; †, $1.45, one-track charge being $1.20, two tracks $1.40, and three or more tracks $1.50. ‡ Or within $4.15 freight zone from works.

WAREHOUSE STEEL PRODUCTS

(Prices, cents per pound, for delivery within switching limits, subject to extras)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140‡		Carbon	Floor
New York(city)	5.82	6.84	7.84	6.14	...	5.97	6.64	8.60	5.95	6.18	7.64
New York(c'try)	5.52	6.64	7.54	5.84	...	5.67	6.34	8.70	5.65	5.88	7.34
Boston (city) ..	5.95	6.75	7.89	5.90	...	5.80	6.39	8.70	5.95	6.58	7.48
Boston (c'try) .	5.75	6.55	7.69	5.70	...	5.60	6.19	8.50	5.75	6.38	7.28
Phila. (city) ..	6.60-6.70	6.75	7.20	5.90	...	5.85	6.46	8.40	5.70	5.90	7.00
Phila. (c'try) ..	6.35-6.45	6.50	6.95	5.65	...	5.60	6.21	8.15	5.45	5.65	6.75
Balt. (city) ...	5.35	6.59	6.77	5.79	...	5.79	6.39	...	5.89	5.60	7.24
Balt. (c'try) ..	5.15	6.39	6.57	5.59	...	5.59	6.19	...	5.69	5.40	7.04
Norfolk, Va. ..	6.10	...	...	6.30	...	6.15	7.20	...	6.20	6.15	7.55
Richmond, Va..	5.55	...	6.80	5.83	...	5.73	6.30	...	5.83	5.65	7.33
Wash (w'hse) .	5.56	6.80	6.73	6.00	...	6.00	6.62	...	6.10	5.81	7.45
Buffalo (del.)..	5.35	6.15	7.10	5.61	...	5.35	5.95	10.10††[3]	5.55	5.85	7.15
Buffalo (w'hse).	5.15	5.95	6.90	5.41	...	5.15	5.75	9.90††[3]	5.35	5.65	6.95
Pitts. (w'hse)..	5.15	5.95*	6.70-6.95	5.20	6.15	5.10	5.75	9.55††	5.25	5.35	6.60
Detroit (w'hse)	5.33	6.08*	7.09	5.49	...	5.39	5.91	9.86††[3]	5.64	5.79	6.88
Cleveland (del.)	5.35	6.15	7.50	5.44	6.25	5.32	5.95	8.31	5.57	5.72	6.92
Cleve. (w'hse).	5.15	5.95	7.30	5.24	6.15	5.12	5.75	8.16	5.37	5.52	6.72
Cincin. (city) ..	5.57	6.14	6.54	5.50	...	5.50	6.11	...	5.79	5.94	7.10
Chicago (city) .	5.35	6.15	7.15	5.30	...	5.30	5.85	9.75††[3]	5.45	5.60	6.80
Chicago (w'hse)	5.15	5.95	6.95	5.10	...	5.10	5.65	9.55††[3]	5.25	5.40	6.60
Milwaukee(city)	5.49	6.29	7.29	5.44	...	5.44	6.09	9.89††[3]	5.59	5.74	6.94
Milwau. (c'try).	5.29	6.09	7.09	5.24	...	5.24	5.89	9.69††[3]	5.39	5.54	6.74
St. Louis (del.)	5.68	6.48	7.28	5.63	...	5.63	6.28	10.08††[3]	5.78	5.93	7.13
St. L. (w'hse).	5.48	6.28	7.08	5.43	...	5.43	6.08	9.88††[3]	5.58	5.73	6.93
Kans. City(city)	5.95	6.75	7.60	5.90	...	5.90	6.55	...	6.05	6.20	7.60
KansCity(w'hse)	5.75	6.55	7.40	5.70	...	5.70	6.35	...	5.85	6.00	7.40
Omaha, Nebr. .	6.13‡	...	8.33	6.13	...	6.18	6.98	...	6.18	6.38	7.83
Birm'ham (del.)	5.30	6.10	6.30[3]	5.25	...	5.25	6.88	...	5.40	5.70	7.83
Birm'hm(w'hse)	5.15	5.95	6.15[3]	5.10	...	5.10	...	...	5.25	5.55	...
Los Ang. (city)	6.10	7.65	7.90	6.15	8.90	6.10	7.75	...	6.10	6.20	8.40
L. A. (w'hse)..	5.90	7.45	7.70	5.95	8.70	5.90	7.55	...	5.90	6.00	8.20
San Francisco .	6.50[3]	7.60[3]	7.50[3]	7.45[3]	8.25[3]	6.30[3]	7.55	...	6.30[3]	6.40[3]	8.50[3]
Seattle-Tacoma.	6.60	8.15[3]	...	6.85	...	6.35	8.50	10.10	6.20	6.35[7]	8.40[7]

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes extra for 10-gage; § as rolled; †† as annealed. Base quantities, 2000 to 9999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; [3]—500 to 1499 lb; [5]—450 to 1499 lb; [6]—1000 to 1999 lb; [7]—300 to 999 lb; [9]—400 to 9999 lb.

REFRACTORIES

(Prices per 1000 bricks, f.o.b. plant)

FIRE CLAY BRICK

Super Duty: St. Louis, Vandalia, Farber, Mexico, Mo., Olive Hill, Hayward, Ashland, Ky., Clearfield, Curwensville, Pa., Ottawa, Ill., $116.60. Hard-fired, St. Louis, Vandalia, Mo., Olive Hill, Ky., $156.20.

High-Heat Duty: Salina, Pa. $99.60; Woodbridge, N. J., St. Louis, Farber, Vandalia, Mexico, Mo., West Decatur, Orviston, Clearfield, Beach Creek, Curwensville, Lumber, Lockhaven, Pa., Olive Hill, Hitchins, Haideman, Ashland, Ky., Troup, Athens, Tex., Stevens Pottery, Ga., Bessemer, Ala., Portsmouth, Oak Hill, O., Ottawa, Ill., $94.60.

Intermediate-Heat Duty: St. Louis, Farber, Vandalia, Mo., West Decatur, Orviston, Beach Creek, Curwensville, Lumber, Lockhaven, St. Marys, Clearfield, Pa., Olive Hill, Hitchins, Haideman, Ashland, Hayward, Ky., Athens, Troup, Tex., Stevens Pottery, Ga., Portsmouth, O., Ottawa, Ill., $88; Bessemer, Ala., $79.20.

Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Orviston, Pa., $79.20; Parral, O., $78.50; St. Marys, Pa., $76; Ottawa, Ill., $70.

LADLE BRICK

Dry Press: Chester, New Cumberland, W. Va., Freeport, Merill Station, Clearfield, Pa., Irondale, Wellsville, O., $66.

Wire Cut: Chester, Wellsville, O., $64.

MALLEABLE BUNG BRICK

St. Louis, Vandalia, Farber, Mo., Olive Hill, Ky., $105.60; Beach Creek, Pa., $94.60; Ottawa, Ill., $90.

SILICA BRICK

Mt. Union, Claysburg, or Sproul, Pa., Portsmouth, O., Ensley, Ala., $94.60; Hays, Pa., $100.10; Joliet, Rockdale, Ill., E. Chicago, Ind., $104.50; Lehi, Utah, Los Angeles, $111.10.

Eastern Silica Coke Oven Shapes (net ton): Claysburg, Mt. Union, Sproul, Pa., Birmingham, $92.40.

Illinois Silica Coke Oven Shapes (net ton): Joliet or Rockdale, Ill., E. Chicago, Ind., Hays, Pa., $93.50.

BASIC BRICK

Per net ton, Baltimore or Chester, Pa. Burned chrome brick, $73; chemical-bonded chrome brick, $77; magnesite brick, $99; chemical-bonded magnesite, $88.

MAGNESITE

Per net ton, Chewelah, Wash. Domestic dead-burned, ¾" grains; bulk, $36.30; single paper bags, $41.80.

DOLOMITE

Per net ton. Domestic, burned bulk; Bonne Terre, Mo., $12.15; Martin, Millersville, Narlo, Clay Center, Woodville, Gibsonburg, Bettsville, O., Billmeyer, Plymouth Meeting, Blue Bell, Williams, Pa., Millville, W. Va., $13.

ORES

LAKE SUPERIOR IRON ORE

Gross ton, 51½% (natural), lower lake ports. After Jan. 25, 1950, increases or decreases, if any, in upper lake rail freight, dock handling charges and taxes thereon are for buyer's account.

Old range bessemer	$8.10
Old range nonbessemer	7.95
Mesabi bessemer	7.85
Mesabi nonbessemer	7.70
High phosphorus	7.70

EASTERN LOCAL ORE

Cents per unit, del. E. Pa.

Foundry and basic 56.62% concentrates contract	16.00

FOREIGN ORE

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	17.00
Long-term contract	15.00
North African hematites	15.75
Brazilian iron ore, 68-69%	18.00

TUNGSTEN ORE

Net ton unit, duty paid

Chinese	$36.00
Brazilian	36.00
Bolivian	36.00
Domestic scheelite, del.	36.00

MANGANESE ORE

Long term contracts, nominal; nearby, 48%, duty paid, 79.8c-81.8c per long ton unit, c.i.f. U. S. ports; prices on lower grades adjusted to manganese content and impurities.

CHROME ORE

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48% 2.8:1	$32.50
48% 3:1	35.00-36.00
48% no ratio	26.00

South African Transvaal

44% no ratio	$17.00-18.00
45% no ratio	17.30-18.30
48% no ratio	26.00
50% no ratio	27.00-27.50

Brazilian

44% 2.5:1 lump	$32.00

Rhodesian

45% no ratio	$20.00-21.00
48% no ratio	26.00
48% 3:1 lump	35.00-36.00
Domestic—rail nearest seller	
48% 3:1	$39.00

MOLYBDENUM

Sulphide concentrates per lb, molybdenum content, mines	$0.90

FERROALLOYS

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton, $70, Palmerton, Pa.; $71, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $172 per gross ton of alloy, c.l., packed, $184; gross ton lots, packed, $199; less gross ton lots, packed, $216; f.o.b. Alloy, W. Va., Niagara Falls, N. Y., Welland, Ont., or Ashtabula, O. Base price: $174, f.o.b. Birmingham and Johnstown, Pa., furnaces, $172, Sheridan, Pa.; $175, Etna, Pa. Shipment from Pacific Coast warehouses by one seller add $33 to above prices, f.o.b. Los Angeles, Oakland, Portland, Oreg. Shipment from Chicago warehouse, ton lots, $214; less gross ton lots, $231 f.o.b. Chicago. Add or subtract $2.15 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 24.75c per lb of contained Mn, carload packed 25.5c, ton lot 26.6c, less ton 27.8c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 75% C—max. 7% Si. **Special Grade:** (Mn 90% min., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max). Carload, lump, bulk 18.15c per lb of contained Mn, carload packed 18.9c, ton lot 20.0c, less ton 21.2c. Delivered. Spot, add 0.25c.

Manganese Metal, 2" x D (Mn 96% min., Fe 2% max., Si 1% max., C 0.2% max.): Carload lump bulk, 29c per lb of metal; packed, 29.75c; ton lot 31.25c; less ton lot 33.25c. Delivered. Spot, add 2c.

Manganese, Electrolytic: 250 lb to 1999 lb, 32c; 2000 to 39,999 lb, 30c; 40,000 lb or more, 28c. Premium for hydrogen-removed metal 1.5c per pound, f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese:. (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 8.95c per lb of alloy, carload packed, 9.70c, ton lot 10.60c, less ton 11.60c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.5c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk, 20.5c per lb of contained Cr. c.l., packed 21.4c, ton lot 22.55c, less ton 23.95c. Delivered. Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

(*Please turn to page* 168)

UNIVERSITY OF MICHIGAN LIBRARIES

Lead and Tin Prices Advance

Straits spot jumps to $1.31 a pound as sensational price rise continues. Lead moves 1 cent higher to 16.80c, in St. Louis. Secondary metal markets display strong undertone

New York—Nonferrous metal prices continue to advance. The movement is well controlled in all markets except tin which has soared sensationally to an all-time high of around $1.31 a pound. Straits spot was quoted around $1.04 a month ago and 97 cents a pound two months ago. Other major price advances last week were in lead, secondary aluminum ingot and scrap metals. Two brass mills made upward revisions in their price schedules at the end of October.

Tin—Bookings in the tin market are restricted by the shortage of metal, as well as by the reluctance of important consumers to pay prevailing prices. Many large buyers are awaiting outcome of the Geneva conference before making new commitments. Sales by the Reconstruction Finance Corp. totaled 1390 tons in October.

World production of tin metal in July was 13,500 tons compared with 15,200 tons in June, reports the International Tin Study Group. This decrease was due chiefly to a drop in production in Malaya and the Netherlands. Production in the United States in July held at 2256 tons. World stocks declined substantially from 126,900 tons at the end of May to 118,500 tons at the end of June.

STEEL'S Metal Price Averages for Oct., 1950

(Cents per pound)

Electrolytic Copper, del. Conn.	24.50
Lead, St. Louis	15.84
Prime, Western Zinc, E. St. Louis.	17.50
Straits Tin, New York	113.39
Primary Aluminum ingots, del.	18.97
Antimony, f.o.b. Laredo, Tex.	32.00
Nickel, f.o.b. refinery	48.00
Silver, New York	74.98

Lead—Persistent demands by lead consumers is steadily tightening supplies and resulted in an advance of 1 cent a pound on Oct. 31. The new basis of 16.80c, St. Louis, and 17.00c, New York, is 6.5 cents a pound above the low established early this year, but is 4.5 cents under the post-OPA peak. Battery manufacturers and cable makers are active buyers; comparatively small tonnages have been required so far for defense orders. Supplies available for November shipment have been practically exhausted. Shipments of refined lead in September increased about 8900 tons to 55,948 tons, the largest recorded since October, 1947. Stocks at refineries at the close of September declined to 61,171 tons from 67,495 tons at the end of August. Production increased to 50,137 tons in September from 47,242 tons in the preceding month.

Copper—Distribution of copper continues on a strict allocation basis with prices unchanged at 24.50c, Connecticut, for electrolytic. Supplies remain well below potential demand, requiring curtailment in consumption. NPA is preparing a regulation which will provide for a cutback of between 25 and 30 per cent in nonmilitary uses of the metal. According to trade reports, the cutback program will apply across-the-board to all users of copper in primary forms, but will not affect the permitted consumption by product or end-use.

Due to increased costs, Chase Brass & Copper Co. and Bridgeport Brass Co. effected upward revisions in their price schedules. The market on brass mill products remains split.

Zinc—Producers of zinc continue to receive a large volume of DO orders, the bulk of which are not being processed pending a clarification of the priorities regulation by NPA. Undertone of the market is strong at 17.50c, E. St. Louis.

Aluminum—Smelters of secondary aluminum ingot have been forced to advance their prices further because of the steady rise in scrap aluminum prices. An increasingly large portion of available scrap is being diverted into conversion channels.

Defense Minerals Administration

Washington — Increased output of aluminum, manganese, copper, zinc and iron ore for rearmament will be the chief objective of a new Defense Minerals Administration which is being established by the Interior Department. The agency will use these devices to spur expansion programs; Government loan guarantees when private capital is available; direct federal loans when private capital is not available; price guarantees on the output of various metal producers; five-year write-offs of new plants and facilities. The agency may take other steps to boost production, including stockpiling purchases and bonus payments.

NPA Issues Aluminum Order

Washington — National Production Authority order M-5 establishes rules for handling defense orders for aluminum under the priorities system. The purpose of the order is to maintain maximum aluminum output by providing equitable distribution of defense orders among aluminum producers, fabricators, distributors and jobbers, thus keeping to a minimum possible disruption of distribution to other aluminum users.

M-5 provides for a 60-day "lead time" in the scheduling of defense orders and requires producers of primary aluminum to accept rated orders from independent fabricators up to 6.5 per cent of the producer's monthly scheduled production of primary aluminum pig and ingot. To provide supplies to independent fabricators, M-5 sets a ceiling on the number of defense orders which aluminum producers need accept in any one month, based both on product and total tonnage.

The ceiling limitations in the order are:

(1) Producers or fabricators will not be required to accept rated orders for the following products for shipment in any one month in excess of the listed percentages of average monthly shipments of the products during the first eight months of 1950: Sheet, plate and strip, 25 per cent; extrusions and tubing, 35 per cent; rolled shapes, 15 per cent; rod bar, wire and cable, 15 per cent; forgings and pressings, 40 per cent; castings, 20 per cent; secondary ingots, 25 per cent; and all other mill products, each 20 per cent.

(2) Producers of primary aluminum are not required to accept rated orders for shipment in any one month of a total tonnage of products, including pig and ingot, in excess of 25 per cent of their scheduled production of total primary pig tonnage for that month.

(3) Producers of secondary aluminum are not required to accept rated orders for shipment in any one month of a total tonnage of aluminum products, including ingots, in excess of 25 per cent of their scheduled production of total ingot tonnage for that month.

(4) Aluminum fabricators are not required to accept rated orders for shipment in any one month of a total tonnage of aluminum products in excess of 25 per cent of their average monthly shipments during the first eight months of 1950.

(5) Unless specifically directed by NPA, no distributor or jobber of aluminum products shall be required to accept rated orders for shipment in any one month of a total tonnage of aluminum products in excess of 25 per cent of the products available to him during such month.

M-5 also provides that NPA will assist anyone who, in placing a rated order, has difficulty in locating a source of supply because of the ceiling limitations. The order also contains provisions for adjustments and exceptions, communications, reports and violations.

In the Top Ten

. . . three nonferrous metals

ELEMENT	PERCENT
1. Oxygen	46.71
2. Silicon	27.69
3. ALUMINUM	8.07
4. Iron	5.05
5. Calcium	3.65
6. Sodium	2.75
7. Potassium	2.58
8. MAGNESIUM	2.08
9. TITANIUM	0.62
10. Hydrogen	0.14
All Other Elements	0.66
	100.00

These are the ten most abundant elements on the earth's surface

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 24.50c, Conn. Valley; Lake 24.62½c, delivered.

Brass Ingot: 85-5-5-5 (No. 115) 29.00c; 88-10-2 (No. 215) 44.50c; 80-10-10 (No. 305) 35.00c; No. 1 yellow (No. 405) 25.50c.

Zinc: Prime western 17.50c; brass special 17.75c; intermediate 18.00c, East St. Louis; high grade 18.60c, delivered.

Lead: Common 16.80c; chemical 16.90c; corroding 16.90c, St. Louis.

Primary Aluminum: 99% plus, ingots 19.00c, pigs 18.00c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders.

Secondary Aluminum: Piston alloys 29.75-30.25c; No. 12 foundry alloy (No. 2 grade) 29.50-29.75c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 31.00-31.50c; grade 2, 29.50-29.75c; grade 3, 29.00-29.25c; grade 4, 28.50-28.75c. Prices include freight at c.l. rate up to 75 cents per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over 24.50c, f.o.b. Freeport, Tex.

Tin: Grade A, spot, prompt, Nov. 131.00c; Dec. 130.00c; Jan. 129.50c; Feb. 129.00c.

Antimony: American 99-99.8% and over but not meeting specifications below 32.00c; 99.8% and over (arsenic 0.05% max.; other impurities 0.1% max.) 32.50c; f.o.b. Laredo, Tex., for bulk shipments. Foreign, 99%; Chinese 34.00c; English, 32.75c; Belgian, 32.75c, duty paid, New York.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 48.00c; 25-lb pigs, 50.50c; "XX" nickel shot, 51.50c; "F" nickel shot or ingots, for addition to cast iron, 48.50c. Prices include import duty.

Mercury: Open market, spot, New York $92.50-$95 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $30.00 per lb contained Be, f.o.b., Reading, Pa.

Cadmium: "Regular" straight or flat forms, $2.40 del.; special or patented shapes $2.65.

Cobalt: 97-99%, $1.80 per lb for 500 lb (keg); $1.82 per lb for 100 lb (case); $1.87 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York 80.00c per oz.

Platinum: $90-$93 per ounce from refineries.

Palladium: $24 per troy ounce.

Iridium: $200 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, cents per pound, f.o.b. mill)

Sheet: Copper 39.93-41.68; yellow brass 36.86-38.28; commercial bronze, 95%, 39.91-41.61; 90%, 39.48-41.13; red brass, 85%, 38.54-40.14; 80%, 38.12-39.67; best quality, 39.15; nickel silver, 18%, 50.57-51.91; phosphor-bronze grade A, 5%, 58.49-60.20.

Rods: Copper, hot-rolled 35.78-37.53; cold-drawn 37.03-38.78; yellow brass free cutting, 31.26-32.63; commercial bronze, 95%, 39.60-41.30; 90%, 39.17-40.82; red brass 85%, 38.23-39.83; 80%, 37.81-39.36.

Seamless Tubing: Copper 39.97-41.72; yellow brass 39.87-41.29; commercial bronze, 90%, 42.14-43.79; red brass, 85%, 41.45-43.05; 80%, 42.58.

Wire: Yellow brass 37.15-38.57; commercial bronze, 95%, 40.20; 90%, 39.77-41.42; red brass, 85%, 38.83-40.43; 80%, 38.41-39.96; best quality brass, 39.44.

Copper Wire: Bare, soft, f.o.b. eastern mills, c.l. 28.67, l.c.l. 29.17, 100,000 lb lots 28.545; weatherproof, f.o.b. eastern mills, c.l. 29.60, l.c.l. 30.10, 100,000 lb lots 29.35; magnet, del., 15,000 lb or more 34.50, l.c.l. 35.25.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders.

Sheets and Circles: 2S and 3S mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	30.1	...	...
0.135-0.096	12-48	30.6	...	...
0.095-0.077	12-48	31.2	29.1	33.2
0.076-0.061	12-48	31.8	29.3	33.4
0.060-0.048	12-48	32.1	29.5	33.7
0.047-0.038	12-48	32.5	29.8	34.0
0.037-0.030	12-48	32.9	30.2	34.6
0.029-0.024	12-48	33.4	30.5	35.0
0.023-0.019	12-36	34.0	31.1	35.7
0.018-0.017	12-36	34.7	31.7	36.6
0.016-0.015	12-36	35.5	32.4	37.6
0.014	12-24	36.5	33.3	38.9
0.013-0.012	12-24	37.4	34.0	39.7
0.011	12-24	38.4	35.0	41.2
0.010-0.0095	12-24	39.4	36.1	42.7
0.009-0.0085	12-24	40.6	37.2	44.4
0.008-0.0075	12-24	41.9	38.4	46.1
0.007	12-18	43.3	39.7	48.2
0.006	12-18	44.8	41.0	52.8

* Lengths 72 to 180 inches. † Maximum diameter, 26 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	—Round— R317-T4, 17S-T4	R317-T4	—Hexagonal— 17S-T4
0.125	52.0	....	....
0.156-0.188	44.0	....	....
0.219-0.313	41.5	....	....
0.375	40.0	46.0	48.0
0.406	40.0	....	....
0.438	40.0	46.0	48.0
0.469	40.0	....	....
0.500	40.0	46.0	48.0
0.531	40.0	....	....
0.563	40.0	....	45.0
0.594	40.0	....	....
0.625	40.0	43.5	45.0
0.688	40.0	....	45.0
0.750-1.000	39.0	41.0	42.5
1.063	39.0	....	41.0
1.125-1.500	37.5	39.5	41.0
1.563	37.0	....	....
1.625	36.5	....	39.5
1.688-2.000	36.5	....	....

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more $22.00 per cwt; add 50c cwt 10 sq ft to 140 sq ft. Pipe: Full coils $22.00 per cwt. Traps and bends: List prices plus 60%.

ZINC

Sheets, 23.50-23.75c, f.o.b. mill 36,000 lb and over. Ribbon zinc in coils, 22.50-23.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 23.50-24.00c; over 12-in., 23.50-24.00.

"A" NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 69.00c. Strip, cold-rolled, 77.00c. Rods and shapes, 65.00c. Plates, 67.00c. Seamless tubes, 98.00c.

MONEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled 53.00c. Strip cold-rolled 56.00c. Rods and shapes, 51.00c. Plates, 52.00c. Seamless tubes, 86.00c. Shot and blocks, 46.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.31 in. in diameter, less than 25 lb. 55.00-62.00c; 25 to 99 lb. 45.00-52.00c; 100 lb to 5000 lb, 41.00c.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forgings, $6; hot-rolled and forged bars, $6.

Plating Materials

Chromic Acid: 99.9% flake, f.o.b. Philadelphia, carloads, 27.00c; 5 tons and over 27.50c; 1 to 5 tons, 28.00c; less than 1 ton 28.50c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed; Flat untrimmed 36.59-38.34c; oval 36.09-37.84c; cast 37.37c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 1000 lb 55.6c, under 1000 lb 57.6c, f.o.b. Niagara Falls, N. Y.

Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 19.00c; 1000 to 19,000 lb, 18.00c, f.o.b. Niagara Falls, N. Y. Packaged in 100 lb drums add ½-cent.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 200 lb, 19.25c; over 200 lb 28.25c, f.o.b. Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 65.00c; 10,000 to 30,000 lb, 63.00c; 3000 to 10,000 lb, 67.00c, 500 to 3000 lb, 68.00c; 100 to 500 lb, 70.00c; under 100 lb, 73.00c; f.o.b. Cleveland.

Nickel Chloride: 100-lb kegs, 33.50c; 400-lb bbl. 31.50c up to 10,000 lb, 31.00c; over 10,000 lb, f.o.b. Cleveland, freight allowed on barrels, or 4 or more kegs.

Tin Anodes: Bar, 1000 lb and over, nom.; 500 to 999 lb, nom.; 200 to 499 lb, nom.; less than 200 lb, nom.; ball, 1000 lb and over, nom.; 500 to 999 lb, nom.; 200 to 499 lb, nom.; less than 200 lb, nom.; f.o.b. Sewaren, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers nom.; 100 or 300 lb drums only, 100 to 500 lb, nom.; 600 to 1900 lb, nom.; 2000 to 9900 lb, nom.; f.o.b. Sewaren, N. J. Freight not exceeding St. Louis rate allowed.

Zinc Cyanide: 100 lb drums, less than 10 drums 47.7c, 10 or more drums 45.7c, f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb nom.; more than 2000 lb, nom., f.o.b. Carteret, N. J.

Stannous Chloride (Anhydrous): In 400 lb bbl, nom.; 100 lb kegs nom., f.o.b. Carteret, N. J.

Scrap Metals

BRASS MILL ALLOWANCES

Prices in cents per pound for less than 15,000 lb, f.o.b. shipping point.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	23.00	23.00	22.25
Yellow Brass	20.125	19.875	18.75
Commercial Bronze			
95%	21.875	21.625	21.125
90%	21.75	21.50	21.00
Red brass			
85%	21.50	21.25	20.75
80%	21.375	21.125	20.625
Muntz metal	19.00	18.75	18.25
Nickel, silver, 10%	22.25	22.00	11.125
Phos. bronze, A	24.00	23.75	22.75

BRASS INGOT MAKERS' BUYING PRICES

(Cents per pound, delivered eastern refineries, carload lots)

No. 1 copper 26.00; No. 2 copper 24.50; light copper 23.50; composition red brass 21.50c; radiators 17.00; heavy yellow brass 17.00.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 26.00; No. 2 copper 24.50; light copper 23.50; refinery brass (60% copper) per dry copper content 21.00.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Copper and brass: Heavy copper and wire, No. 1 24.50-25.00; No. 2 22.50-23.00; light copper 21.00-21.50; No. 1 composition red brass 18.75-19.00; No. 1 composition turnings 18.25-18.50; mixed brass turnings 13.00-13.50; new brass clippings 18.50-19.00; No. 1 brass rod turnings 17.00-17.50; light brass 11.75-12.00; heavy yellow brass 13.50-14.00; new brass rod ends 17.50-18.00; auto radiators 15.25-15.50; cocks and faucets, 16.75-17.00; brass pipe 17.75-18.00.

Lead: Heavy 13.75-14.00; battery plates 8.25-8.50; linotype and stereotype 14.50-14.75; electrotype 12.75-13.00; mixed babbitt 12.25-12.50.

Zinc: Old zinc 11.00-11.25; new die cast scrap 10.75-11.00; old die cast scrap 8.00-8.25.

Tin: No. 1 pewter 63.00-65.00; block tin pipe 90.00; No. 1 babbitt 58.00-60.00.

Aluminum: Clippings 2S 18.50; old sheets 14.00-15.00; crankcase 15.00; borings and turnings 12.00-12.50.

DAILY PRICE RECORD

1950	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Nov. 2	24.50	16.80	17.50	131.00	19.00	32.00	48.00	80.00
Nov. 1	24.50	16.80	17.50	127.50	19.00	32.00	48.00	80.00
Oct. Avg.	24.50	15.84	17.50	113.39	18.97	32.00	48.00	74.98
Oct. 31	24.50	16.80	17.50	126.00	19.00	32.00	48.00	80.00
Oct. 30	24.50	15.80	17.50	124.25	19.00	32.00	48.00	80.00
Oct. 27-28	24.50	15.80	17.50	121.00	19.00	32.00	48.00	80.00
Oct. 26	24.50	15.80	17.50	119.75	19.00	32.00	48.00	80.00
Oct. 25	24.50	15.80	17.50	118.75	19.00	32.00	48.00	80.00
Oct. 24	24.50	15.80	17.50	117.50	19.00	32.00	48.00	80.00
Oct. 23	24.50	15.80	17.50	116.00	19.00	32.00	48.00	77.75
Oct. 20-21	24.50	15.80	17.50	114.00	19.00	32.00	48.00	72.75
Oct. 19	24.50	15.80	17.50	113.00	19.00	32.00	48.00	72.75
Oct. 18	24.50	15.80	17.50	113.25	19.00	32.00	48.00	72.75

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

UNIVERSITY OF MICHIGAN LIBRARIES

IRON AND STEEL SCRAP

Consumer prices, except as otherwise noted, including brokers'rs' commissions, as reported to STEEL, Nov. 2, 1950; gross tons
Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

Nov. 2	$41.67
Oct. 26	41.67
Oct. 1950	41.37
Nov. 1949	28.96
Nov. 1945	19.17

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

No. 1 Heavy Melt.	$44.00
No. 2 Heavy Melt.	41.00
No. 1 Busheling	44.00
No. 1 Bundles	44.00-46.00
No. 2 Bundles	39.00
Heavy Turnings	43.00-44.00
Machine Shop Turnings	*36.00-37.00†*
Mixed Borings, Turnings	*36.00-37.00†*
Short Shovel Turnings	38.00
Cast Iron Borings	36.00-37.00
Low Phos. Steel	*53.00-54.00*

Cast Iron Grades

No. 1 Cupola Cast	*55.00-56.00*
No. 1 Machinery Cast	*57.00-58.00*
Charging Box Cast	*47.00-48.00*
Heavy Breakable Cast	*46.00-47.00*

Railroad Scrap

No. 1 R.R. Heavy Melt.	44.00
Rails, Random Lengths	59.00-60.00
Rails, 2 ft. and under	*66.50-67.50‡*
Rails, 18 in. and under	*67.50-68.50‡*
Railroad Specialties	*60.00-61.00*

† Crushers' buying prices.
‡ Nominal.

CLEVELAND

(Delivered Consuming Plant)

No. 1 Heavy Melt. Steel	$43.00-43.50
No. 2 Heavy Melt. Steel	39.00-39.50
No. 1 Busheling	42.50-43.00
No. 1 Bundles	42.50-43.00
No. 2 Bundles	31.00-31.50
Machine Shop Turnings	35.00-35.50
Mixed Borings, Turnings	36.50-37.00
Short Shovel Turnings	36.50-37.00
Cast Iron Borings	36.50-37.00
Low Phos.	46.00-46.50

Cast Iron Grades

No. 1 Cupola	62.00-63.00
Charging Box Cast	49.00-50.00
Stove Plate	46.00-47.00
Heavy Breakable Cast	49.00-50.00
Unstripped Motor Blocks	39.00-40.00
Brake Shoes	46.00-47.00
Clean Auto Cast	62.00-63.00
No. 1 Wheels	52.00-53.00
Burnt Cast	43.00-44.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	44.00
R.R. Malleable	64.00-65.00
Rails, 3 ft and under	64.00-65.00
Rails, 18 in. and under	65.00-66.00
Rails, Random Lengths	60.00-61.00
Cast Steel	51.00-52.00
Railroad Specialties	53.00-54.00
Uncut Tires	58.00-59.00
Angles, Splice Bars	61.00-62.00

VALLEY

No. 1 Heavy Melt. Steel	$43.50-44.00
No. 2 Heavy Melt. Steel	39.50-40.00
No. 1 Bundles	43.50-44.00
Facty. Prod. Bundles	43.50-44.00
No. 2 Bundles	34.00-34.50
Machine Shop Turnings	35.00-35.50
Short Shovel Turnings	37.00-37.50
Cast Iron Borings	37.00-37.50
Low Phos.	46.00-46.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	43.50-44.00

PHILADELPHIA

No. 1 Heavy Melt. Steel	$39.00-43.00
No. 2 Heavy Melt. Steel	*36.00*
No. 1 Busheling	38.00
No. 1 Bundles	39.00-43.00
No. 2 Bundles	32.00
Short Shovel Turnings	33.00
Machine Shop Turnings	*29.00*
Mixed Borings, Turnings	26.00-27.00
Low Phos. Punchings and Plate, elec. fur. grade	*49.00*
Low Phos. Plate, 5 ft & Under	48.00-49.00
Elec. Furnace Bundles	45.00
Heavy Turnings	39.00
No. 1 Chemical Borings	40.00
Knuckles and couplers	51.00-52.00
Steel car wheels	51.00-52.00

Cast Iron Grades

No. 1 Cupola Cast	50.00-51.00
No. 1 Machinery Cast	*54.00-55.00*
No. 1 Yard Cast	49.00-50.00
Charging Box Cast	50.00-51.00
Heavy Breakable Cast	*49.00-50.00*
No. 1 Wheels	60.00
Malleable	64.00

CINCINNATI

No. 1 Heavy Melt. Steel	*$43.50*
No. 2 Heavy Melt. Steel	*40.50*
No. 1 Busheling	*43.50*
No. 1 Bundles	*43.50*
No. 1 Black Bundles	*40.50*
No. 3 Bundles	*30.00*
Machine Shop Turnings	*29.00*
Short Shovel Turnings	*31.00*
Mixed Borings, Turnings	*30.00*
Cast Iron Borings	*31.00*

Cast Iron Grades

No. 1 Cupola Cast	62.00
Charging Box Cast	53.50
Stove Plate	*45.00*
Heavy Breakable Cast	*52.00*
Unstripped Motor Blocks	40.00
Brake Shoes	34.00
Clean Auto Cast	62.00
Drop Broken Cast	65.00
Low Phos., 18 in. and under	*56.00*

Railroad Scrap

No. 1 R.R. Heavy Melt.	44.00
R.R. Malleable	60.00
Rails, Rerolling	62.00
Rails, Random Lengths	62.00
Rails, 18 in. and under	70.00

DETROIT

(Brokers' buying prices, f.o.b. shipping point)

No. 2 Heavy Melt. Steel	$30.00-31.00
No. 1 Bundles	37.00-37.50
No. 2 Bundles	29.00-30.00
No. 1 Busheling	37.00-37.50
Machine Shop Turnings	29.00-29.50
Forge Flashings	37.00-37.50
Short Shovel Turnings	31.00-31.50
Cast Iron Borings	31.00-31.50
Punchings & Plate Scrap	39.00-40.00

Cast Iron Grades

No. 1 Cupola Cast	*50.00-55.00*
Heavy Breakable Cast	35.00-40.00
Clean Auto Cast	*55.00-60.00*

BUFFALO

No. 1 Heavy Melt. Steel	$41.00-42.00
No. 2 Heavy Melt. Steel	38.00-38.50
No. 1 Busheling	38.00-38.50
No. 1 Bundles	39.50-40.00
No. 2 Bundles	36.00-36.50
Machine Shop Turnings	*31.50-32.50*
Mixed Borings, Turnings	35.00-36.00
Cast Iron Borings	35.00-36.00
Short Shovelings	35.00-36.00
Low Phos.	44.00-45.00

Cast Iron Grades

No. 1 Cupola	*46.00-47.00*
No. 1 Machinery	*49.00-50.00*
Malleable	*56.00-58.00*

Railroad Scrap

Rails, 2 ft. and under	60.00-61.00
Rails, random size	53.00-54.00
Railroad Specialties	53.00-53.50

NEW YORK

(Brokers' buying prices f.o.b. shipping point)

No. 1 Heavy Melt. Steel	$34.50*
No. 2 Heavy Melt. Steel	29.00-30.00
No. 1 Busheling	32.00-33.00
No. 1 Bundles	34.50*
No. 2 Bundles	28.00-29.00
Mixed Borings, Turnings	24.50-25.00
Machine Shop Turnings	24.50-25.00
Short Shovel Turnings	26.00-27.00
Punchings & Plate Scrap	37.00-38.00
Low Phos. Plate, 5 ft & under	37.00-38.00
Elec. Furnace Bundles	36.00-37.00

Cast Iron Grades

No. 1 Cupola Cast	*40.00-41.00*
No. 1 Machinery	*42.00-43.00*
Charging Box Cast	*40.00-41.00*
Heavy Breakable	*40.00-41.00*
Unstripped Motor Blocks	*34.00-35.00*

* Nominal

BOSTON

(F.o.b. shipping point)

No. 1 Heavy Melt. Steel	*$32.50-33.00*
No. 2 Heavy Melt. Steel	28.50-29.00
No. 1 Bundles	*32.50-33.00*
No. 1 Busheling	*29.00-29.50*
Machine Shop Turnings	23.50-24.50
Short Shovel Turnings	25.00-26.00
Mixed Borings, Turnings	25.00-25.50
Bar Crops and Plate	40.00-42.00
Punchings & Plate Scrap	40.00-42.00
Chemical Borings	29.00-30.00

Cast Iron Grades

No. 1 Cupola Cast	41.00-42.00
Mixed Cast	39.00-40.00
Heavy Breakable Cast	38.50-39.50
Stove Plate	39.00-41.00

CHICAGO

No. 1 Heavy Melt. Steel	$40.00
No. 2 Heavy Melt. Steel	38.00
No. 1 Bundles	40.00
No. 2 Bundles	35.00
Machine Shop Turnings	*34.00*
Mixed Borings, Turnings	*34.00*
Short Shovel Turnings	*34.00-36.00**
Cast Iron Borings	*34.00*
Low Phos.	*49.00-51.00*
Elec. Furnace Bundles	*42.00-43.00*
Heavy Turnings	37.00-38.00
Cut Structurals	*47.00-48.00*

Cast Iron Grades

No. 1 Cupola Cast	*54.00-56.00*
Clean Auto Cast	54.00-56.00
No. 1 Wheels	*54.00-55.00*
Stove Plate	43.50-44.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	*46.00-47.00**
Malleable	*66.00-67.00*
Rails, Rerolling	64.00-65.00
Rails, Random Lengths	*59.00-60.00*
Rails, 2 ft. and under	*64.00-65.00*
Rails, 18 in. and under	*65.00-66.00*
Railroad Specialties	*56.00-57.00*
Angles, Splice Bars	*59.00-60.00*

* Brokers' buying price.

BIRMINGHAM

No. 1 Heavy Melt. Steel	$38.00-40.00
No. 2 Heavy Melt. Steel	34.00-35.00
No. 1 Busheling	36.00
No. 2 Bundles	35.50
Machine Shop Turnings	30.00
Mixed Borings, Turnings	28.00
Short Shovel Turnings	34.00
Cast Iron Borings	28.00
Bar Crops and Plate	44.00-45.00
Cut Structurals	44.00

Cast Iron Grades

No. 1 Cupola Cast	54.00
Stove Plate	47.00-48.00
No. 1 Wheels	nominal

Railroad Scrap

No. 1 R.R. Heavy Melt.	40.00-41.00
R.R. Malleable	nominal
Rails, Rerolling	58.00-59.00
Rails, 2 ft and under	59.00-60.00
Angles and Splice Bars	50.00

ST. LOUIS

No. 1 Heavy Melt. Steel	*$41.00-43.00*
No. 2 Heavy Melt. Steel	*36.50-37.50*
No. 1 Bundles	*40.00-41.00*
No. 2 Bundles	*36.00-37.00*
Machine Shop Turnings	*30.00-31.00*
Short Shovel Turnings	*31.00-32.00*

Cast Iron Grades

No. 1 Cupola Cast	*51.00-53.00*
Charging Box Cast	*43.00-45.00*
Heavy Breakable Cast	*45.00-46.00*
Brake Shoes	47.00-49.00
Clean Auto Cast	*55.00-57.00*
Burnt Cast	*42.00-43.00*

Railroad Scrap

R.R. Malleable	*62.00-64.00*
Rails, Rerolling	*60.00-61.00*
Rails, Random Lengths	*58.00-60.00*
Rails, 2 ft and under	*61.00-63.00*
Uncut Tires	*53.00-54.00*
Angles, Splice Bars	*60.00-62.00*
Railroad Specialties	*55.00-57.00*

SAN FRANCISCO

No. 1 Heavy Melt. Steel	$26.50
No. 2 Heavy Melt. Steel	24.50
No. 1 Bundles	26.50
No. 2 Bundles	22.50
No. 3 Bundles	19.50
Machine Shop Turnings	13.00
Low phos, electric	40.00

Cast Iron Grades

No. 1 Cupola Cast	45.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	26.50
Rails, Random Lengths	26.50

SEATTLE

No. 1 Heavy Melt. Steel	$24.00*
No. 2 Heavy Melt. Steel	24.00*
No. 1 Busheling	21.50
Nos. 1 & 2 Bundles	22.00
No. 3 Bundles	18.00
Machine Shop Turnings	15.00
Mixed Borings, Turnings	15.00
Punchings & Plate Scrap	30.00-32.50
Cut Structurals	30.00-32.50

Cast Iron Grades

No. 1 Cupola Cast	35.00-41.00
Heavy Breakagle Cast	30.00-35.00
Stove Plate	25.00-27.50
Unstripped Motor Blocks	30.00
Malleable	30.00
Brake Shoes	30.00
Clean Auto Cast	35.00
No. 1 Wheels	32.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	25.00
Railroad Malleable	30.00
Rails, Random Lengths	26.00
Angles and Splice Bars	25.00

* Nominal

LOS ANGELES

(F.o.b. car, Los Angeles)

No. 1 Heavy Melt. Steel	$26.50
No. 2 Heavy Melt. Steel	24.50
No. 1 Bundles	26.50
No. 2 Bundles	22.50
No. 3 Bundles	17.50
Machine Shop Turnings	13.00
Punchings & Plate Scrap	40.00

Cast Iron Grades

No. 1 Cupola Cast	49.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	nominal
Rails, Rerolling	39.50

HAMILTON, ONT.

(Delivered prices)

Heavy Melt.	$30.00
No. 1 Bundles	30.00
Mechanical Bundles	28.00
Mixed Steel Scrap	28.00
Mixed Borings, Turnings	23.00
Rails, Remelting	30.00
Rails, Rerolling	33.00
Busheling	24.50
Bushelings new factory, prep'd	28.00
Bushelings new factory, unprep'd	23.00
Short Steel Turnings	23.00

Cast Iron Grades*

No. 1 Machinery Cast.	45.00

* F.o.b. shipping point.

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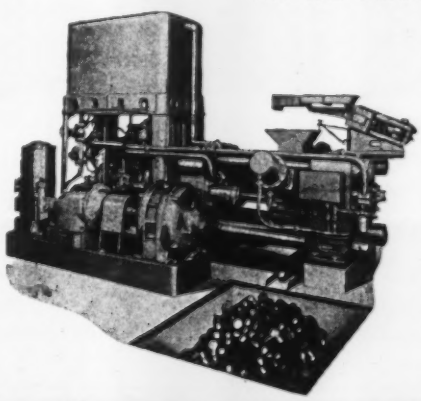
Balance between ***profit*** and ***loss*** in the reclamation of scrap lies in a MILWAUKEE Hydraulic Briquetting Press. Cast iron, steel, brass, magnesium, bronze, and aluminum turnings, borings, and chips can be converted into compact, uniform, solid cylindrical blocks quickly and easily with little or no loss. These briquettes, identical in size and weight, reduce scrap handling and storage problems to a minimum. Classified as high-grade scrap, briquettes can be charged into furnace or cupola more readily and with greater economy than loose scrap.

Leading manufacturers of automobiles, heavy-duty mobile equipment, farm implements, aircraft, plumbing supplies, auto parts, pumps, and other high-production products currently are briquetting their scrap profitably. Many have increased self-sufficiency by reducing their dependence on outside scrap sources.

Of primary importance, also, is the fact that many of these plants have written off the *entire cost* of a MILWAUKEE Briquetting Press in one year or less. Write today for BULLETIN No. 117 to obtain complete specifications on available sizes of MILWAUKEE Briquetting Presses.



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This new wire developed by Keystone helps recessed head screw manufacturers to lower production costs. It delivers the desired forming and upsetting qualities uniformly. Because of excellent flow properties — die and plug life are often more than doubled — production records show fewer rejections and reduced inspection time. Keystone Cold Heading Wire is "special processed" for *tough* Cold Heading jobs.

Keystone's process of *drawing after galvanizing* smooths and hardens the zinc coating, increasing its lasting qualities and its physical properties. This shiny smooth finish, corrosion resistant Spring Wire is now available in Type 2 and Type 3 heavy weight zinc coating as well as the regular weight suitable for most applications.

If your product requires "special" steel wire, please consult us.

Sheets, Strip . . .

Sheet and Strip Prices, Page 149 & 150

Boston—Rated orders make up the bulk of flat-rolled buying. Consumers are pressing for space on first quarter schedules. Tonnage for general distribution is smaller. Carryovers are substantial.

New York—While sheet sellers have been accepting first quarter business on certain specialties, such as electrical sheets, they have taken no action for that period on the major products, apart from defense tonnage.

Philadelphia—While time is fast approaching when sheet producers should be setting up schedules for next quarter, extent of preference tonnage is so uncertain they are holding off to the last minute or until 45 days before the beginning of the new year, which is the official lead-time on military orders. Most are setting aside minimum tonnage they must accept on DO ratings and are already being advised in most cases as to what they will be expected to supply for the car program. There is uncertainty as to what they may be called upon to supply for other allocation programs including jobber allotments.

Pittsburgh—Some sheet sellers are booked through February on maximum tonnage of DO rated orders that must be booked. In some instances, plate commitments for railroad freight car program will further reduce available sheet and strip tonnage for nonessential uses because of necessity to roll light plates on sheet mills. Tonnage for landing mats represents the largest single end use rated tonnage received to date.

American Cladmetals Co., Carnegie Pa., will complete installation of a 30-in. cold reduction mill next year. The unit was purchased from Jones & Laughlin Steel Corp.'s Otis Works two years ago.

Elliott Bros. Steel Co., New Castle, Pa., advanced cold-rolled carbon strip $5 per ton to $4.75 per 100 pound base for under 20 gage and $5 per 100 pounds for 20 gage and heavier, effective Oct. 20. Cold-finished spring steel was advanced $10 per ton in 0.26-0.40 per cent carbon range and $7 per ton for higher carbon ranges.

Cleveland—Sheetmakers are expected to open books soon for January tonnage, all the signs indicating they will not accept business from regular customers for the full first quarter. Currently, DO orders are taking only a relatively small percentage of total output but the volume is rising steadily. Full impact of rated business on supply will begin to be felt in first quarter.

Detroit—As of Nov. 1, Detroit Steel Corp. advanced prices on cold-rolled 35 cents per hundred to $5.10 locally and to $5.35 at New Haven, Conn. McLouth Steel is holding its price at $4.95 for the present, and as far as is known officially Great Lakes Steel continues to quote $4.35. Demand is unabated. General Motors divisions are putting on heavy pressure to squeeze out extra allotments before yearend.

Chicago — Ceiling amount of DO rated sheet tonnage is already booked by some mills as far ahead as March.

Indications are January non-rated production will be written off to carryover by some interests, thereby reducing consumers' quotas by a third, plus whatever other reductions are required by change in product mix to accommodate greater plate output. Conversion tonnage is under tight allocation, only old customers being booked. One mill, effective Jan. 1, will set aside its DO tonnage and will figure quotas only from its civilian tonnage. Thus regular customers with DO ratings will receive the DO material ex-quota. This plan is designed to discourage customers from seeking DO material elsewhere and disrupting normal relationships.

St. Louis — Cold-rolled sheet production is dropping as Granite City Steel Co. shifts to DO-rated plate orders. Only 6 per cent of ingot tonnage is going into plates, but it is expected to rise to 15 per cent soon. Company has been out of the plate business, except for one long-term pipeline order, more than a year. Its output of galvanized roofing sheets has been cut one-third because of zinc scarcities.

Los Angeles—Columbia Steel Co. is accepting DO rated orders for flat-rolled tonnage through September of next year. Producers are allocating more capacity to flat-rolled products than the 5 per cent called for by NPA.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 149

Boston—Fabricators are turning down volume due to smaller allocations. Deliveries are more extended. Contractors also have difficulty placing orders for sheet piling.

Philadelphia — Sweets Steel Co., Williamsport, Pa., has advanced rail steel merchant bars and rail steel reinforcing bars $5 a ton, to 4.50c and 4.60c, mill, respectively, effective Nov. 1. Also light rails $5 a ton to 4.25c per pound.

Chicago—Ban on amusement building construction is not expected to make a dent in reinforcing bar demand.

Los Angeles — Construction fabricators are rushed by customers seeking to complete jobs before building curbs go into effect. Reinforcing bar supplies are adequate.

Steel Bars . . .

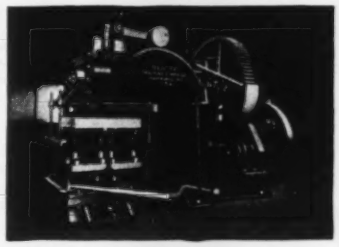
Bar Prices, Page 149

Boston — First quarter bar mill schedules are filled. Carryovers make up substantial volume for rolling in January. Alloy buying is mounting and a good part of incoming volume is rated. Schedules are subjected to revision.

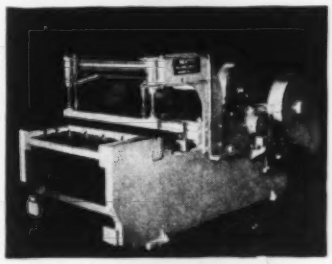
Philadelphia—Cold bar finisher at Camden, N. J., has increased turned, ground and polishing and turned and polishing extras $10 a ton and ground and polishing extras $5 a ton.

Cold finishers have accepted orders into second quarter. Generally the hot bar mills have not opened books for shipments beyond the turn of the year.

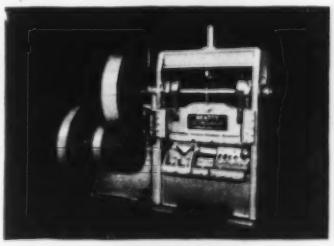
Pittsburgh — Increased volume of DO rated tonnage is reported by merchant carbon and alloy bar producers. The deadline on lead time for January shipment isn't until Nov.



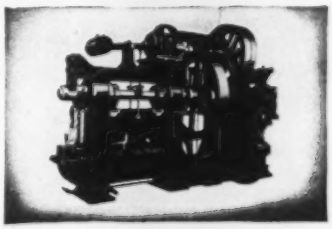
BEATTY No. 11-B Heavy Duty Punch widely used in the railroad industry.



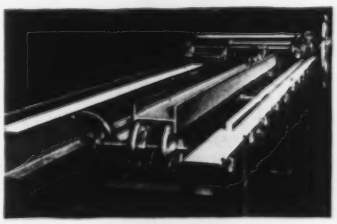
BEATTY Horizontal Multiple Punch for flange punching of long, wide sheets.



BEATTY Guillotine Bar Shear shears angles, rounds, bars and squares without changing tools.



BEATTY CoPunShear — one compact unit does coping, punching, shearing.



BEATTY Spacing Table handles flange and web punching without roll adjustment.

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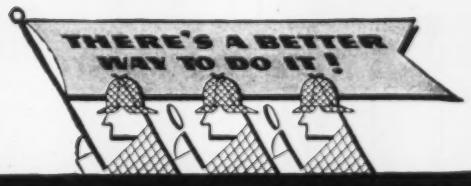

HYDRAULIC HEAVY METAL WORKING EQUIPMENT

BEATTY MACHINE AND MFG. COMPANY
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15, but some sellers already have booked maximum tonnage reservation for DO rated orders for that period. Alloy bar interests in particular must alter previously established tentative schedules for January and beyond. Some cold finishers are booked into April.

Cleveland—Bar mills are sold out for remainder of the year and with DO volume rising expect to enter 1951 with substantial order carryover. Full impact of emergency demands will not be felt until next quarter since the 45-days lead time on rated orders provides some leeway. Cold bar interests are booked well ahead but they are having difficulty obtaining sufficient hot bar tonnage to permit delivery commitments.

Wire . . .

Wire Prices, Page 151

Pittsburgh—American Steel & Wire adjusted base prices downward on galvanized merchant quality wire, barbed wire and woven fence and galvanized stone wire at the same time effecting new "sliding scale" galvanizing extras resulting in an increase of about $4 per ton. There is no change in base price for galvanized nails, staples and fence posts since higher zinc costs are entirely reflected in applicable extras. Columbia Steel Co. and Tennessee Coal, Iron & Railroad Co. have revised base prices a like amount on products produced.

Birmingham — Shortage in wire products continues; in wire nails it is critical; in fencing, not quite so bad; in manufacturers' wire probably even a little better.

Export Prices Revised

New York—United States Steel Export Co. raised export base prices to reflect current price of zinc. Prices in the revised schedule include freight to New York, Philadelphia or Baltimore and are effective with shipments from producing mills Oct. 21.

	Discount
American Standard Pipe, T & C	
Galv. Buttweld, 2½", 3"	22.9
Galv. Seamless 3½"-6"	15.4
English Gas Tubes, T & C	
Galv. Buttweld, 2½", 3"	24.8
	Per 80 Rod Spool
Galv. Barbed Wire	
Lyman 4 pt 5"	$6.08
	Per 100 lb.
Glidden 4 pt 5"	7.08
Iowa 4 pt 3" or 6"	7.08
Waukegan 4 pt 3" or 6"	7.08
Galv. Plain Wire	6.07
Galv. Nails, 15 Ga 7 coarser	8.99*
Galv. Staples 9 Ga	7.79*

* Includes galvanizing extra

Tin Plate . . .

Tin Plate Prices, Page 150

New York — While canners are pressing tin plate producers for new contracts, the latter are awaiting settlement of wage negotiations. Higher prices undoubtedly will be named because of increased costs and prospects of still further advances. Whereas a year ago tin was holding around 80 cents, later to drop as low as 73 cents in first quarter, it is now around $1.25 with the undertone strong.

Pittsburgh—Higher tin plate prices for 1951 are expected to be announced Nov. 15. Sellers expect bulk of carryover tonnage to be cleared up by year end. Rated orders for January delivery have not reached 5 per cent maximum of base period average monthly shipments.

American Can Co. plans to close New Castle, Pa., evaporated milk can plant Dec. 31. The plant has been operated since 1908 and currently employs about 130 persons. Output of this plant will be shifted to Maywood, Ill.

Chicago — Operational difficulties during the tryout period of a new electrolytic tin plating line of one producer here are holding output below schedules. Carryover tonnage is expected to be large. Some curtailment of tin plate output will occur next quarter when more raw material is directed to plates.

Tubular Goods . . .

Tubular Goods Prices, Page 152

New York—Pressure for merchant pipe continues strong. Firm prices are quoted by district resellers, whereas this spring some were offering discounts of as much as 15 per cent.

Cleveland—Pipemakers are booked solidly through 1951 and there is little prospect a buyer can place additional tonnage without a preference order. Jobbers are up against it with their stocks highly unbalanced. Considerable foreign pipe has been coming in at Gulf and Atlantic ports.

NEW ISSUES

Kaiser Steel Corporation

$60,000,000

3¾% First Mortgage Bonds, Due 1970

These Bonds have been placed directly by the undersigned with institutional investors and are not offered to the public.

1,600,000 Shares of $1.46 Preferred Stock

(Cumulative—Stated Value $25 per Share)

800,000 Shares of Common Stock

(Par Value $1.00 per Share)

Offered in Units consisting of One Share of Preferred Stock and One-half Share of Common Stock, transferable only as Units until October 1, 1951, unless separated earlier as set forth in the Offering Prospectus.

Price $25 per Unit

Plus accrued dividends on the Preferred Stock from September 30, 1950

Copies of the Prospectus for the public offering of the Units may be obtained from such of the several underwriters, including the undersigned, only in States in which such underwriters are qualified to act as dealers and in which the Prospectus may legally be distributed.

The First Boston Corporation

NEW YORK BOSTON PITTSBURGH CHICAGO

PHILADELPHIA CLEVELAND SAN FRANCISCO

October 25, 1950.

Some of this is reaching the Midwest. Last week some 250 tons of pipe destined for gas transmission lines in Ohio was unloaded at Baltimore. The tonnage, which was shipped by Stewarts & Lloyds, Ltd., British steelmaker, is said to be the initial cargo of a substantial tonnage to be shipped over the next several months.

Portland, Oreg.—American Pipe & Construction Co. is operating at capacity. Beall Pipe & Tank Corp. has a 300-ton job in its shop. Local plants report a good volume of small jobs, but shortage of plates makes it difficult to bid firmly on large projects.

San Francisco—Kaiser Steel Corp. increased prices of galvanized pipe $3 to $5 a net ton.

Plates . . .

Plate Prices, Page 149

Boston—First quarter allocations to tank shops and other civilian users are being figured, railroad requirements cutting deeply into mill schedules. Light plates are especially short. Demand for heavier plates for fabrication of weldments is higher.

New York—Plate producers generally are committing themselves only on defense work. They are booked up solidly for this year and are not accepting commercial tonnage for first quarter. An exception involves a little tonnage which is still being booked by premium mills and where some special fabrication can be done by the producer.

Philadelphia—Plate mills are restricting new orders to DO ratings and such programmed allocations as are coming through—only on cars up to this time.

The Conshohocken, Pa., producer has advanced high-strength, low-alloy plates $5 a ton, to 5.60c per pound mill; also high-strength, low-alloy hot-rolled sheets and strip to 5.30c and 5.20c, respectively, an increase of $5 a ton in each instance.

Pittsburgh—Jones & Laughlin Steel Corp. has established a new schedule of width and quantity extras applicable to mill edge plates produced on strip mills. Additional charge of 15 cents per 100 pounds is applied for sheared plates thus produced. Size extras for strip mill plates are $10 to $12 per ton above those for the comparable plate mill product. Width brackets range from 22 to 90 in. inclusive with applicable extras of 40 to 80 cents per 100 pounds for gage brackets ranging from 0.750 to 0.180 in.

New quantity extras are as follows: Under 20,000 to 15,000 pounds inclusive, 10 cents per 100 pounds; under 15,000 to 10,000 pounds, 20 cents; under 10,000 to 6000 pounds, 30 cents; under 6000 pounds to 4000 pounds, 50 cents; under 4000 to 2000 pounds, $1; under 2000 pounds $1.50.

Cleveland—Plate sellers cannot satisfy all of the demands coming to them and supply conditions are expected to worsen steadily so far as unrated requirements are concerned. Full impact of the freight car and other emergency programs still is to be felt. Allotments for such account are mounting steadily. Expectations are Republic Steel will resume rolling light plates, possibly within a month or so. Last spring Republic discontinued booking plate tonnages.

Chicago—Most consumers are unable to get definite commitments from the mills for first quarter. Schedules have had to be rejuggled to accommodate freight car tonnage. Output of some interests will be stepped up to handle DO, preferential tonnage and usual civilian business.

Oregon Steel Raises Prices

Portland, Oreg.—Oregon Steel Mills, this city, is operating at capacity. Prices of structurals have been raised from 4.05c to 4.25c; hot-rolled bars, from 4.20c to 4.40c; reinforcing bars, from 4.20c to 4.70c. Merchant bars are in active demand, deal-ers restocking following heavy shipments due to military operations in Korea.

Structural Shapes . . .

Structural Shape Prices, Page 149

Boston—Relatively little building is effected by the goverment limitation ruling. New inquiry has slackened, but additional contracts for the arterial highway, Boston, are due this month.

Pittsburgh—Fabricators note increased inquiries of military nature, particularly for bridges. Most interests have largest backlog of year to date and contend shortage of steel prevents stepping up production

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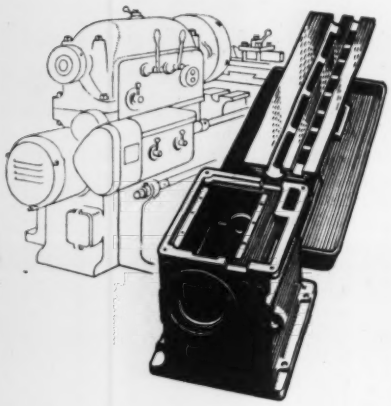

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schedules with result deliveries are becoming further extended.

Chicago — Fabricators are scraping the bottom of inventories and are unable to replenish stocks at the rate of consumption. Warehouses note tag ends left after specified lengths have been cut from stock sizes are now eagerly sought at full price. These are welded to proper length by constructors. At least one mill will cut bar rolling to take on more structural orders.

Birmingham—Shapes are in stronger demand. Fabricators are reasonably well booked. The smaller structural shapes are in greatest demand. Some large-scale construction is indicated for early spring.

Portland, Oreg. — Fabricators are fairly busy, but scarcity of steel is handicapping operations. Small jobs are numerous; in bidding on larger projects, provision is made for delayed shipments.

San Francisco—Stran Steel Division, Great Lakes Steel Corp., Ecorse, Mich., was awarded contract for 3000 quonset huts, 200 quonset-type warehouses and 320 tool kits, total $7,542,225.20. Yards & Dock supply office, Port Hueneme, Calif., placed the order.

Refractories . . .

Refractories Prices, Page 153

Pittsburgh—Globe Brick Co. advanced prices $6 a ton Oct. 16 on dry press ladle brick to $66 and on wire cut ladle brick to $64, Chester, Pa. Crescent Brick Co. also advanced dry press ladle brick to $66, New Cumberland, W. Va., on same date.

Pig Iron . . .

Pig Iron Prices, Page 148

Boston—Inventories are better balanced, part of recent buying having been for stock. Melt is higher. Relatively few orders for castings carry DO ratings.

New York—Demand for pig iron and coke is mounting rapidly and is well in excess of supply. Foreign iron is attracting greater attention, although importers have little to offer before January or February.

Buffalo — Pig iron production dropped last week when the Bethlehem's Lackawanna plant was forced to bank its six blast furnaces because of a wildcat strike. All furnaces were making basic iron. Merchant iron continues in brisk demand.

Philadelphia—Pig iron demand continues in excess of domestic supply. Return to operation of the larger blast furnace at Swedeland, Pa., has relieved the situation to some extent.

Pittsburgh—Jobbing foundry shops have granted AFL employees 7.50 cents an hour wage increase. Some jobbing shops recently raised castings prices 10 to 15 per cent. In addition to higher wage costs since early April, foundries are paying $3 per ton more for pig iron, $1 to $2 per ton more for coke and nearly $20 per ton more for No. 1 machinery cast scrap. Some jobbing shops are falling further behind in deliveries, while others report a leveling off in bookings.

Cleveland—Merchant iron suppliers

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are under extreme pressure for shipments. Demand continues in excess of supply and no relief is in prospect though sellers expect a slackening in demand on civilian account within three months. Military and other emergency requirements, however, will take up whatever slack appears. The foundries are using more scrap in melts but with cast scrap selling at $62 to $63 per ton, as against $49.50 for No. 2 foundry pig iron, increased use of scrap is unattractive.

St. Louis — Tight pig supplies, booming foundry operations and high scrap prices have boosted iron demand to an all-time high.

Birmingham—Merchant iron melters are besieged with business. Better than 90 per cent of southern iron is being consumed in the south, but the supply still is far from adequate.

San Francisco—Kaiser Steel Corp. raised price of basic pig iron to $55 a ton and foundry grade to $55.50. The prices are purely nominal as Kaiser has no iron for sale.

Seattle—Pig iron from South Africa has been ordered by local users. The grade is excellent; the price about the same as European which averages $1.50 below domestic levels. Deliveries are about 90 days. Some Provo iron is being used locally. Coke is up $2.

Scrap . . .

Scrap Prices, Page 156

New York—Brokers are paying $1 higher on major cast iron grades of scrap. They are quoting $40-$41 on No. 1 cupola, charging box and heavy breakable cast; $42-$43 on No. 1 machinery; $34-$35 on unstripped motor blocks. Offerings on No. 1 heavy melting and No. 1 bundles continue nominal at $34.50, with situation at the moment very much snarled up as both brokers and most consumers appear to be marking time on these grades.

Philadelphia—No. 2 heavy melting steel is moving a little more freely at $36 and machine shop turnings are easier at $29. The situation otherwise is strong, with low phos punchings and plate scrap, electric furnace grade, higher at $49; No. 1 machinery cast and heavy breakable cast at $54-$55 and $49-$50, respectively.

Pittsburgh—Strong price undertone prompted major mills to temporarily stay out of the market for November scrap commitments in effort to maintain "formula" price levels for open hearth grades. In recent weeks mills have been paying so called springboard to bring dealer scrap in from remote areas, in some instances amounting to nearly $2.50 premium. Crushers have been forced to pay up to $37 for machine shop and mixed turnings to fill old $38 orders for short shoveling turnings. Relatively little $38 short turnings tonnage is unshipped, and there is some indication this price may move upward on next large tonnage mill purchase. Low phos grades also are stronger within range of $53 to $54. Price trend for cast grades also continues to move into new high ground, with sales of No. 1 cupola within range of $55 to $56, an increase of $6. Railroad specialties are up $1.50 to range of $60 to $61, rails 2 ft and under

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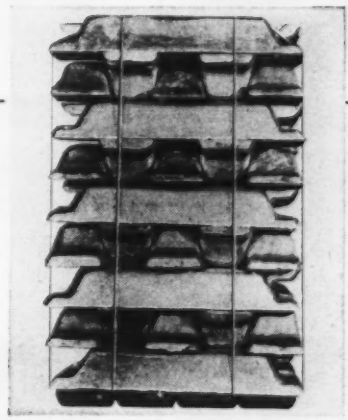

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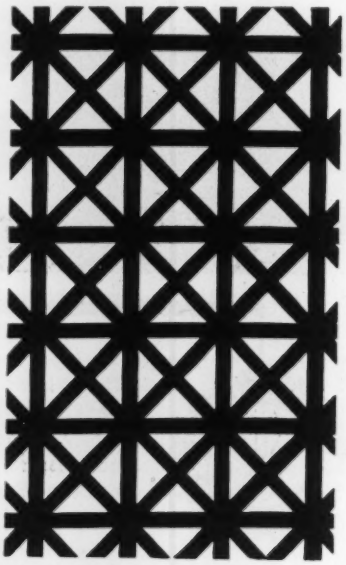

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were offered last week at $2 to $2.50 below previous quotation but no sales were reported.

Buffalo—Cast scrap prices advanced $2 a ton. Strength was also apparent in steelmaking items, although prices are unchanged. Dealers continue to ship against extended contracts negotiated on the formula setup. Leading mills have huge reserves despite capacity ingot operations.

Cleveland—Activity in the scrap market is confined to routine business. Some traders believe the quietness may be the calm before the storm. They point out that the unusually warm weather this fall has lulled some users into complacency regarding their winter stocks and that there likely will be a rush to cover forward needs later this month. Advent of railroads' November lists may signal the start of a fresh buying wave by mills. Undertone of the market is strong, but prices are unchanged.

Detroit — Automotive scrap lists went according to formula with probably 99 per cent of the tonnage being "earmarked." Brokers claim the mills have their hands tied completely. Some pay a springboard on industrial scrap but not on dealer material; others have a different policy. Some establish a $5 differential on No. 2 bundles; others $3. There is practically no free scrap for brokers to buy, and cases are reported where mills even refuse to pay broker commissions, saying these fees will have to be paid by the shipper. Cast grades continue to soar with clean auto cast as high as $60.

Cincinnati—Scrap prices are strong as melters seek to bolster stocks before advent of winter weather. A few minor markups show the trend, despite attempts to hold the line at formula. Cast grades, which had been rising steadily, are leveling off.

Chicago—One mill obtained small quantities of allocated open-hearth scrap at formula prices last week. Brokers are not actively soliciting new orders in these grades and in many cases are paying above the formula to cover old orders. Several traders believe scrap price controls would be desirable. Some scrap is being held for speculation, particulary railroad grades, but stocks generally are rapidly turned over. Out-of-district interests have buoyed the turnings market, $34 now being a minimum buying price. All foundry items are in strong demand. Railroad grades command a substantial premium and much of this material is resorted or cut to circumvent formula prices. Delivered price of No. 1 railroad heavy melting on the basis of latest list is up $1.

St. Louis — Sharply higher outside demand and continuing efforts of local foundries to lay in inventories have lifted scrap prices again. Foundries over-delayed winter stockpiling in expectations of early price controls and are now paying top prices. Cast grades are up $2 to $5.

Birmingham—Scrap prices are unchanged in a strong market. Buying is relatively strong, but supplies are somewhat heavier due to larger movement of agricultural scrap.

Los Angeles—Mills fear steelmak-

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ing scrap shortage may limit steel production. When scrap inventory slumped to the dangerously low level of three week's supply, Columbia Steel Co. staged a successful scrap drive. Off-shore scrap imports resumed with arrival of 5000 tons for Bethlehem Pacific Coast Steel Corp.

Seattle—Scrap prices have not been raised officially, but $24 quoted for No. 1 and No. 2 heavy melting is about $4 below the actual level. Steel scrap supplies continue critical. Bethlehem Pacific Coast Steel Corp. received 3000 tons from Western Alaska and a second cargo of 9000 tons from Europe is due shortly.

Foundry operations, lacking war contracts, are slowing with advance of the season. While cast iron scrap is scarce, sufficient tonnage is available for current operations. As high as $41.50, delivered plant, has been paid.

Iron Ore . . .

Iron Ore Prices, Page 153

Cleveland—Iron ore shipments from the upper lake ports are maintained close to capacity, totaling 2,574,457 tons in the week ended Oct. 30 compared with 2,640,573 tons the preceding week. For the first time this year, the season's total exceeds the comparable figure for 1949, amounting to 69,720,899 tons and 68,273,990 tons, respectively.

Shipments from United States ports alone amounted to 2,490,194 tons for the week ended Oct. 30, equivalent to average daily loading rate of 355,742 tons, and bringing the season's total to date to 67,980,954 tons, or an increase of 1,250,119 tons over the total for the like 1949 period.

Toronto, Ont.—Production of iron ore from the Steep Rock Iron Mines Ltd., so far this season stands at 1,135,830 tons against 1,134,261 tons for all of last year. The objective for this season is 1,200,000 tons.

Warehouse . . .

Warehouse Prices, Page 153

Pittsburgh—Upward adjustments in warehouse steel base prices are expected to reflect higher prices quoted by some mills on strip and sheets. Action is being delayed pending clarification of the wage issue with accompanying general steel price advance among major steel producers expected this month.

Jones & Laughlin Steel Corp. has established a new schedule of combination width and gage extras covering plates produced on strip mills. The size extras also have been adopted by independent warehouses supplied by Jones & Laughlin, and represent an advance of $10 to $12 per ton. Company also increased flame cutting extras. Previously an extra of 25 cents per lineal foot was charged for first 50 feet in flame cutting plate 1-inch thick, and 16 cents for each additional foot. Current extra for same thickness is 37 cents per foot for first 100 feet and 28 cents for each additional foot. Extras for flame cutting have been similarly revised for the other plate thicknesses, such as: One-quarter inch, 19 and 10 cents, respectively; 2 inches, 45 and 36 cents, etc.

Warehouse steel stocks of sheets

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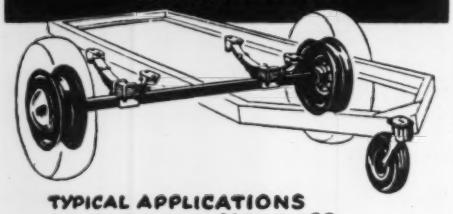

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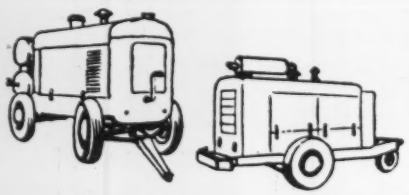

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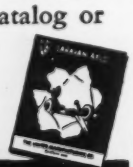

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and strip are so low that some interests are limiting new bookings to DO rated orders.

Philadelphia—Most leading warehouses came close to sustaining business in October at the September level. Some state business was fully sustained, with incoming shipments from the mills better than anticipated.

Cleveland — Unbalanced inventory position of local warehouses shows no improvement. Mill shipments are coming in steadily but since warehouse quotas for the quarter have been cut the same as those of other mill customers, intake is not sufficient to balance stock outgo. Distributors are banking heavily on expected action by the National Production Authority directing the mills to allocate tonnage to the warehouses. The purpose of this projected order is to assure that small buyers' steel supplies will not be cut too severely.

Detroit—Detailed forms have been received from the NPA, requesting extensive information on inventories of all types of steel as of Sept. 30, comparing them with June 30. Data are required for "evaluation of the current steel situation." There is some feeling that the comparison with June 30 will not mean much and might better have been made with stocks as of a year ago.

Cincinnati—Appeals to warehouses for steel indicate shortages are curbing fabricators' schedules. Inquiries from distant points, falling on deaf ears, tend to prove the desperate hunt for tonnage.

Los Angeles—Supplies of steel limit warehouses in filling DO rated orders. Mills are replacing warehouse tonnage moved to customers with DO's but warehouse-mill confusion over DO order interpretation still rules. Distributor sales in October held firm at the September level.

Seattle — Warehouse volume has dropped, due to broken stocks and continued shortages. Distributors cannot depend on mill shipments and are worried over the effect of priorities on current schedules. Buyers unable to effect mill contracts are covering immediate needs from warehouse stocks which are badly broken.

Canada . . .

Toronto, Ont.—Canadian producers are co-operating to the fullest extent in the supply of steel for defense orders, but there is not enough to go around. Greatest scarcity is in sheets. Most of the problem is in obtaining sufficient supplies from the United States. This year Canadian producers will turn out about 3,250,000 tons, highest in history.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 152

Pittsburgh — Cambria country, Pennsylvania, has about 1.9 billion tons of commercially important coking coal reserves (in beds 28 inches thick and thicker), of which 931 million tons are recoverable on the basis of present mining methods. This estimate is made by the Bureau of Mines in a report which contains several maps and which is the first to be issued in connection with a nation-wide survey of known coking coal reserves.

Birmingham—Sloss-Sheffield Steel & Iron Co., this city, awarded a contract to Koppers Co. Inc., Pittsburgh, for a new battery of 30 coke ovens at Pratt City, Ala. The contract involves about $2 million. Work will be started immediately.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

10,000 tons, generator station, Consolidated Gas & Electric Co., Astoria, N. Y., to American Bridge Co., Pittsburgh.

5300 tons, power house, American Gas & Electric Corp., Glasgow, W. Va., to Virginia Bridge Co., Roanoke, Va.

3525 tons, towers and grillages for Bonneville Power Administration, to Bethlehem Pacific Coast Steel Corp., Seattle.

3400 tons, Tuberculosis hospital, New York, to Bethlehem Steel Co.

1125 tons, state bridge, Ulster county, New York, to American Bridge Co., Pittsburgh.

1125 tons, factory, Louisville, Ky., to Belmont Iron Works, Eddystone, Pa.

1100 tons, power plant, Public Service Co. of New Hampshire, Portsmouth, N. H., to Lyons Iron Works, Manchester, N. H.

1000 tons, Lookout Point dam project, to Consolidated Western Steel Corp., Seattle.

880 tons, administration building, Garden City, N. Y., through Psaty & Fuhrman Inc., general contractor, New York, to Bethlehem Steel Co.

675 tons, casting building, Anaconda Copper Mining Co., Perth Amboy, N. J., to Bethlehem Steel Co.

575 tons, high school, Bethlehem, Pa., to Bethlehem Contracting Co., that city.

500 tons, imbedded materials, including anchor bolts, McNary and Detroit dams, Oregon state, to Schmitt Steel Co., Portland.

490 tons, office building addition, Manufacturers Trust Co., 43rd St. and Fifth Ave., New York, to Bethlehem Steel Co.

425 tons, Penney Mercantile Bldg., Louisville, Ky., to Bethlehem Steel Co.

400 tons, central heating plant, air base, Limestone, Me., to Bancroft & Martin Rolling Mills Co., Portland, Me.; Stewart & Williams Inc., Augusta, Me., general contractor.

300 tons, addition to public school No. 120, Queens, N. Y., to Schacht Steel Construction Inc., New York.

225 tons, warehouse, Dan River Mills Inc., Danville, Va., to Bethlehem Steel Co.

210 tons, building, Winfield, Kans., to Bethlehem Steel Co.

200 tons, warehouse, Athos Steel Services, Philadelphia, to Bethlehem Steel Co.

100 tons, floating bridge, Lackawanna Railroad, Hoboken, N. J., to American Bridge Co., Pittsburgh.

STRUCTURAL STEEL PENDING

15,000 tons, towers and other structures for Bonneville Power Administration, Portland, Oreg.; plans out early November, bids in near future.

7500 tons, superstructure for state turnpike bridge, Newark, N. J.; bids postponed indefinitely. However, 4000 tons of steel piling for substructure are scheduled for bidding Nov. 6.

4500 tons, municipal highway, New Orleans, Virginia Bridge Co., Roanoke, Va.; low bidder.

3200 tons, state bridge, Allegheny county, Pennsylvania; bids Dec. 8.

2250 tons, sheet steel piling, Peck Creek causeway, Bergen county, New Jersey, for State Turnpike Authority; bids Nov. 21. 433 tons of reinforcing steel also are required.

2200 tons, state bridge work, Westmoreland and Indiana counties, Pennsylvania; bids Dec. 8.

2000 tons, military warehouses, Fort Richardson, Alaska; bids in to U. S. Engineer, Anchorage, Nov. 2.

1400 tons, Southern Pacific Railway bridge, Lookout Point relocation project; bids to U. S. Engineer, Portland, Oreg., Dec. 1.

575 tons, also 60 tons reinforcing, Washington state truss bridge, Skagit county; general contract to General Construction Co., Seattle, low $548,636.

430 tons, state bridge, Delaware county, Pennsylvania; Berlanti Construction Co., Harrison, N. J., low on general contract.

385 tons, three span continuous WF beam bridge, Berkshire, Vt.; bids Nov. 10, Montpelier; also 55 tons, reinforcing bars.

225 tons, New Brunswick, N. J., interchange for New Jersey Turnpike Authority; Deleson Steel Co., Englewood, N. J., low on fabrication.

200 tons, hospital, Phoenixville, Pa.; bids asked.

200 tons, factory building, Pierce-Phelps Co., Philadelphia; bids Nov. 8; Robert E. Lamb, that city, general contractor.

150 tons, Coolin forest bridge; bids in to Bureau of Public Roads, Portland, Oreg., Nov. 2.

100 tons, including reinforcing, Washington state Ferry county bridge; no bids received at opening Oct. 24.

REINFORCING BARS . . .

REINFORCING BARS PLACED

209 tons, LR246, highway job, Allegheny and Butler counties, Pa., to Jones & Laughlin Steel Co.

200 tons, contract 18C, Calumet intercepting sewer, Blue Island, Ill., to United States Steel Supply Co., Chicago.

160 tons, 24th St. school, Milwaukee, to United States Steel Supply Co., Chicago.

140 tons, state institution, Lewistown, Mont., to Bethlehem Pacific Coast Steel Corp., Seattle.

104 tons, breakwater extension, Chicago, to United States Steel Supply Co., that city.

REINFORCING BARS PENDING

900 tons, LR77, paving job, Beaver county, Pa.; bids asked.

725 tons, municipal outdoor amphitheater, Pittsburgh; bids asked.

500 tons, St. Michaels Hospital, Grand Forks, N. D.; bids asked.

455 tons, highway structures, Baltimore-Washington parkway, Anne Arundel county, Maryland; bids Nov. 17, Bureau of Public Roads, Washington.

375 tons, 710-foot Yakima river bridge; bids in to Atomic Energy Commission, Richland, Wash., Oct. 30.

314 tons, Beechmont levy, Cincinnati; bids asked.

285 tons, Chain Belt Co., Milwaukee; bids asked.

270 tons, staff apartment building, Medical Center, Chicago; bids asked.

208 tons, state bridge work, Allegheny and Westmoreland counties, Pennsylvania, bids Nov. 22; also 358 tons of structural steel.

205 tons, municipal court and jail, Gary, Ind.; bids asked.

160 tons, Eshelman Grain Co., Columbus, O.; bids asked.

157 tons, high school, Palatine, Ill.; bids asked.

140 tons, Washington state highway projects; bids in.

139 tons, state highway project 492, Akron; bids asked.

126 tons, state bridge work, Route LR 40033 (5-7) Luzerne county, Pennsylvania; bids Nov. 22; also 113 tons of structural steel; another bridge project in same county, Route LR 40116 (4), 390 tons of structural steel.

124 tons, high school, Alliance, O.; bids asked.

118 tons, vocational school, International Harvester Co., Chicago; bids asked.

PLATES . . .

PLATES PLACED

3000 tons, for Great Northern Railway, to Bethlehem Pacific Coast Steel Corp., Seattle.

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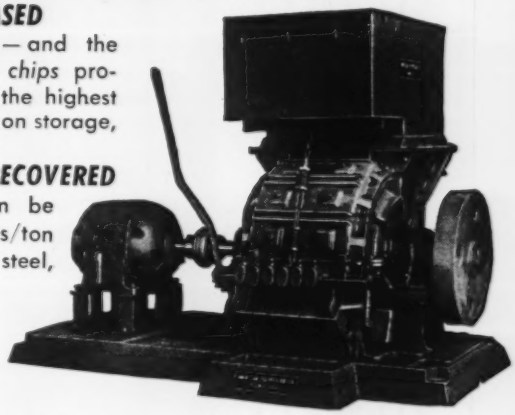

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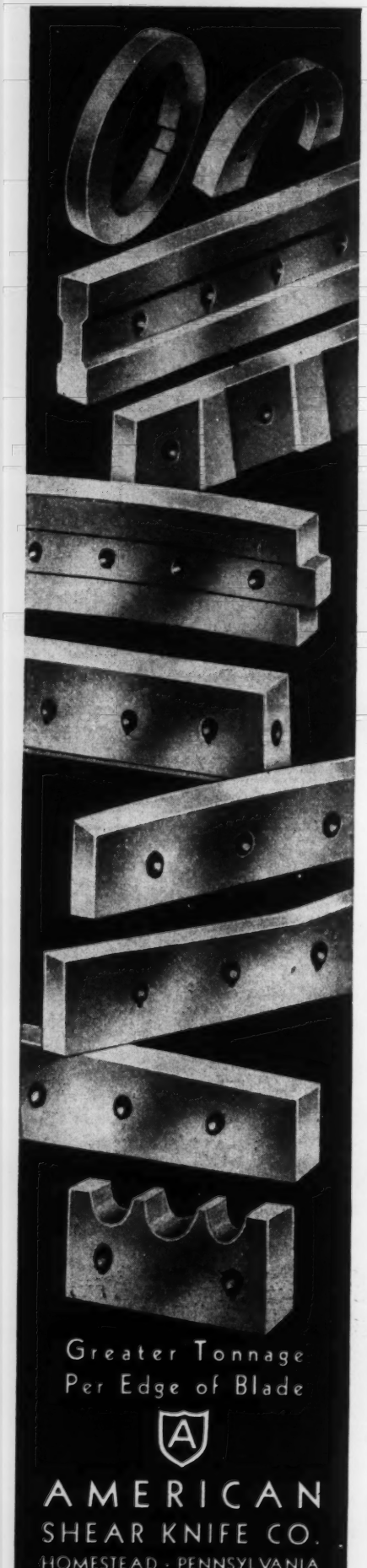

1200 tons, tanks, Texas Co., New York, to Chicago Bridge & Iron Co., Chicago.

900 tons, four tanks, Esso Standard Oil Co., Baltimore, to Bethlehem Steel Co.

645 tons, tanks, Texas Co., New York, to General American Transportation Co., Chicago.

600 tons, 12,000 feet 30 and 36 inch supply line for Spokane, Wash., to American Pipe & Construction Co., Portland, Oreg.

375 tons, fuel oil storage tanks, New York Central Railroad, Ninoa, N. Y., to Bethlehem Steel Co.

300 tons, 60 and 66 inch pipe for Spokane Valley Irrigation District, to Beall Pipe & Tank Corp., Portland, Oreg.

175 tons, Navy purchasing office, Washington, to Carnegie-Illinois Steel Corp., Pittsburgh.

100 tons, elevated tank for Atomic Energy Commission, Richland, Wash., to American Pipe & Construction Co., Portland, Oreg.

PLATES PENDING

2600 tons, extra heavy plate, Ross dam penstocks, Seattle light department; bids in near future.

650 tons, penstocks for Cushman power plant, Tacoma, Wash., light department; Willamette Iron & Steel Co., Portland, Oreg., low $237,073.

130 tons, interlocking sheet steel piling; bids to Bonneville Power Administration postponed to Nov. 9.

Unstated, water filtration plant and 750,000-gal reservoir, under construction at Clarkston, Wash. for Washington Water Power Co.

PIPE . . .

STEEL PIPE PENDING

Unstated, 30 inch steel discharge pipe and corrugated drain pipe, Kootenai river levee; J. S. Anderson and H. C. Greendahl, Spokane, joint low bid $263,604.

CAST IRON PIPE PENDING

800 tons or more, 20 inch supply line, Ship Creek power project, Alaska; S. Macri Co. low to U. S. Engineer, Anchorage, $370,918.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Chicago and Eastern Illinois, six 1500-hp diesel-electric locomotives, to Electro-Motive Division, General Motors Corp., La Grange, Ill.

RAILROAD CARS PLACED

Chicago & Eastern Illinois, 25 flat and 25 covered hopper cars, to Thrall Car Co., Chicago Heights, Ill.

RAILS PLACED

Pennsylvania, 96,000 tons, 133 to 155-lb. sections, to Carnegie-Illinois Steel Corp., Bethlehem Steel Co., and Inland Steel Co.

FERROALLOYS

(*Continued from page 153*)

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, max. 0.03% C 31.85c per lb of contained Cr, 0.04% C 29.75c, 0.06% C 28.75c, 0.10% C 28.25c-28.5c, 0.15% C 28.0c, 0.20% C 27.75c, 0.50% C 27.5c, 1% C 27.25c, 1.50% C 27.1c, 2% C 27.0c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 5c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 5c for each 0.25% of N above 0.75%.

Foundry Ferrochrome, High Carbon: (Cr 62-66%, C 5-7%). Contract, c.l. 8 MxD, bulk, 22.0c per lb of contained Cr, c.l., packed 22.9c, ton 24.25c, less ton 26.0c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max.) Contract, Carload, packed, 8 MxD, 15.35c per lb of alloy; 1 ton, 16.2c; less ton lot, 17.4c, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34.41%, Si 42-49%, C 0.05% max.) Contract, carload, lump, 4" x down and 2" x down, bulk, 20.50c per lb of contained chromium plus 11.30c per pound of contained silicon; 1" x down, bulk 20.65c per pound of contained chromium plus 11.50c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Ferrochrome Silicon, No. 2: (Cr 36-39%, Si 36-39%, Al 7-9%, C 0.05% max.) 20.5c per lb of contained silicon plus 11.3c per lb of contained silicon plus aluminum, 3" x down, delivered.

Chromium Metal: (Min. 97% Cr and 1% Fe). Contract carload, 1" x D; packed, max 0.50% C grade, $1.03 per lb of contained chromium, ton lot $1.05, less ton $1.07. Delivered. Spot add 5c.

Silicon Alloys

25-30% Ferrosilicon: Contract, carload, lump, bulk, 17.00c per lb of contained Si; packed 18.40c; ton lot 19.50c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 11.3c per lb of contained Si, carload packed 12.9c, ton lot 14.35c, less ton 16c. Delivered, Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 13.5c per lb of contained Si, carload packed 14.8c, ton lot 15.95c, less ton 17.2c. Delivered, Spot, add 0.8c.

80-90% Ferrosilicon: Contract, carload, lump, bulk, 14.65-15.0c per lb of contained Si, carload packed 15.9c, ton lot 16.9c, less ton 18.05c. Delivered, Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.) Add 0.7c to 85% ferrosilicon prices.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 16.5c per lb of contained Si, carload packed 17.7c, ton lot 18.65c, less ton 19.7c. Delivered, Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.). Add 0.7c to 90-95% ferosilicon prices.

Silicon Metal: (Min. 97% Si and 1% max. Fe). C.l. lump, bulk, regular 19.0c per lb of Si, c.l. packed 20.2c, ton lot 21.1c, less ton 22.1c. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing min. 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 8.65c per lb of alloy, ton lots packed 10.05c, 200 to 1999 lb 10.40c, smaller lots 10.90c. Delivered, Spot up 0.5c.

Briquetted Alloys

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 13.75c per lb of briquet, carload packed 14.45c, ton lot 15.25c, less ton 16.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 10.45c per lb of briquet, c.l. packaged 11.25c, ton lot 12.05c, less ton 12.95c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 10.30c, per lb of briquet, c.l. packaged 11.1c, ton lot 11.9c, less ton 12.8c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.15c per lb of briquet, c.l. packed 6.95c, ton lot 7.75c, less ton 8.65c. Delivered. Spot, add 0.25c.
(Small size—weighing approx 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.30c, c.l. packed 7.10c, ton lot 7.90c, less ton 8.80c. Delivered. Add 0.25c for notching small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.04 per pound of Mo contained, f.o.b. Langeloth, Pa.

Calcium Alloys

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 19.25c per lb of alloy, carload packed 20.05c, ton lot 21.55c, less ton 22.55c. Delivered. Spot add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 17.9c per lb of alloy, carload packed 19.1c, ton lot 21.0c, less ton 22.5c. Delivered. Spot add 0.25c.

Titanium Alloys

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max., Si 4% max., C 0.10% max.). Contract, ton lots 2" x D, $1.40 per lb of contained Ti; less ton $1.45. (Ti 38-43%, Al 8% max., Si 4% max., C 0.10% max.) Ton lot $1.28, less ton $1.35, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $167 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destina-

tions east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 3-4.5%.) Contract, $183 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

Vanadium Alloys

Ferrovanadium: Open-hearth Grade (Va 35-55%, Si 8-12% max., C 3-3.5% max.). Contract, any quantity, $2.90 per lb of contained Va. Delivered. Spot, add 10c. **Crucible-Special Grades** (Va 35-55%, Si 2-3.5% max., C 0.5-1% max.), $3. **Primos and High Speed Grades** (Va 35-55%, Si 1.50% max., C 0.20% max.) $3.10.

Grainal: Vanadium Grainal No. 1, 93c per lb; No. 6 63c; No. 79, 45c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.20 per lb contained V_2O_5, freight allowed. Spot, add 5c.

Tungsten Alloys

Ferrotungsten: (70-80%). Contract, 10,000 lb W or more, $2.50 per lb of contained W; 2000 lb W to 10,000 lb W, $2.60; less than 2000 lb W, $2.72. Spot, add 2c.

Tungsten Powder: (W 98.8% min.). Contract or spot, 1000 lb or more, $3.40 per lb of contained W; less than 1000 lb W, $3.50.

Zirconium Alloys

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, Fe 40-45%, C 0.20% max.). Contract, c.l., lump, bulk 6.6c per lb of alloy, c.l. packed 7.35c, ton lot 8.1c, less ton 8.95c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Contract carload, lump, packed 20.25c per lb of alloy ton lot 21c, less ton 22.25c. Freight allowed. Spot, add 0.25c.

Boron Alloys

Ferroboron: (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Contract, 100 lb or more, 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices 100 lb and over are as follows: Grade A (10-14% B) 75c per pound; Grade B (14-18% B) $1.20; Grade C (19% min. B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $4.25 per lb contained B, f.o.b. Philo, O., with freight not to exceed railroad freight allowed to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) contract, lump carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

Other Ferroalloys

Ferrocolumbium: (Cb 50-60%, Si 8% max., C 0.4% max.). Contract, ton lot, 2" x D, $3.50 per lb of contained Cb, less ton $3.55. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min., C 0.30 max.) ton lots, 2" x D, $2.67 per lb of contained Cb plus Ta, delivered; less ton lots $2.72.

Silcaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed, 1" x D, 43c per lb of alloy, ton lot 45c, less ton 47c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Contract, carload, packed, ½" x 12 M, 16.5c per lb of alloy, ton lots 17.25c, less ton 18.5c. Delivered. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 17.0c per lb of alloy; ton lots 18.0c; less ton lots 19.50c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed, 14.25c per lb of alloy; ton lots 15.75c; less ton lots 17.00c, f.o.b., Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al). Lump, bulk, carload 11.00c. Ton lots, bulk 11.50c, packed 11.75c. Less ton lots, packed 12.25c per lb of alloy, f.o.b. Philo, O., with freight not to exceed railroad freight allowed to destination.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base); carloads, f.o.b. seller's works, Mt. Pleasant, or Siglo, Tenn., $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb, contained Mo, f.o.b. Langeloth, $1.22; Washington, Pa., furnace, any quantity $1.13.

Technical Molybdic-Oxide: Per lb, contained Mo., f.o.b. Langeloth $1.04, packed in bags containing 20 lb of molybdenum; Washington, Pa., 95.00c.

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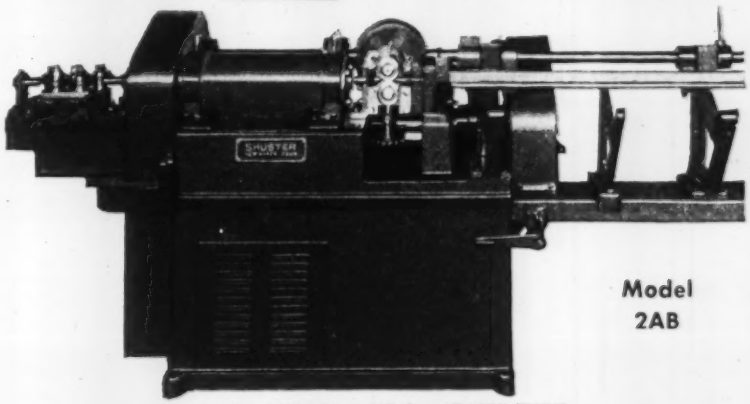

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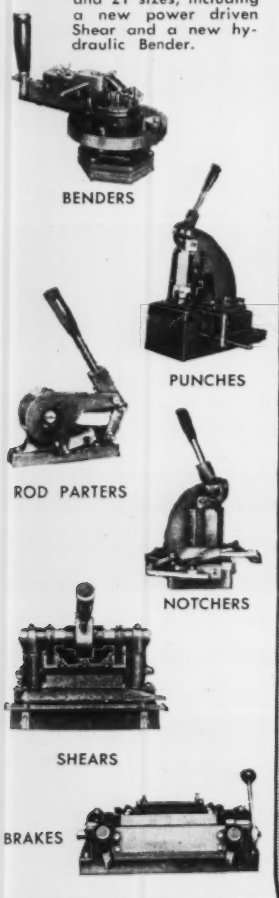

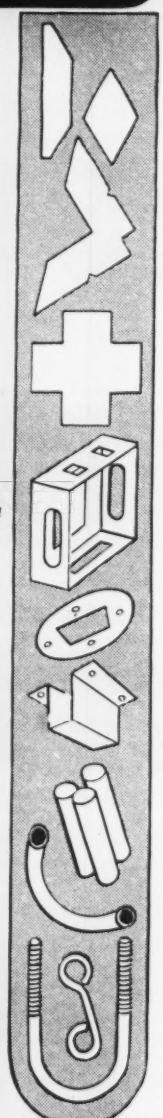

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Metalworking Briefs

CONSTRUCTION, ENTERPRISE ORGANIZATIONAL CHANGES

California

Aerojet Engineering Co., Azusa, Calif., subsidiary of General Tire & Rubber Co., Akron, O., started construction of a machine shop building for production of liquid and solid propellant rocket "Jato" motors. Completion is scheduled by December.

California

W. C. Koenig Engineers is constructing a machine shop in Burbank, Calif., with facilities for experimental tool, die and stamping for the aircraft industry.

California

Binks Mfg. Co., Chicago, purchased a plant, located at 4915 Pacific Blvd., Los Angeles. Some sheet metal fabricating work will be done at this plant in addition to branch office work involving the warehousing and selling of standard spray finishing and water cooling equipment and the assembly of air compressors.

California

McCabe-Powers Auto Body Co., producer of truck bodies, plans a 35,000 square foot factory in Oakland, Calif. Estimated cost is expected to be around $250,000.

California

Gilmore Steel & Supply Co., San Francisco, purchased the Moore-West shipyard in Oakland, Calif., from the General Services Administration for approximately $1.5 million. Facilities at the 35-acre yard include warehouses, a large structural steel fabricating shop, several cranes and other ship repair equipment.

Connecticut

Torrington Co., Torrington, Conn., will build a one-story factory to meet demand for increasing production of antifriction bearings. Operations currently housed in the Standard plant will be transferred to the new and larger unit, expected to be in operation about mid-1951.

Connecticut

Whiton Machine Co., New London, Conn., manufacturer of lathe chucks, centering machines and gear cutting machines, appointed the following to represent the company in their respective areas: Allen Steel & Supply Co., Fort Wayne, Ind.; Peoria Tool & Engineering Co., Peoria, Ill.; E. L. Essley Machine Co., Chicago; Bond Supply Co., Kalamazoo, Mich.; Oatis Machinery Co., Indianapolis; Anderson Machine Tool Co., St. Paul; Martin & Prestegaard Co., Minneapolis; Sterling Products Co., Chicago; Colcord-Wright Machinery & Supply Co., St. Louis.

Connecticut

Mettler Machine Tool Inc., New Haven, Conn., manufacturer of automatic wire straightening and cutting machines, appointed Artys Sales Co., New York, as its sales representative in New York city, New Jersey and vicinity.

Delaware

E. I. du Pont de Nemours & Co. plans further alterations to its shops at Maryland avenue and Foundry street, Wilmington, Del., at an estimated cost of $123,000.

Illinois

Eclipse Fuel Engineering Co., Rockford, Ill., awarded the general contract for construction of a storage, machine shop and fabricating building to Scandroli Construction Co., Rockford, at about $200,000. Bradley & Bradley, that city is the architect.

Illinois

International Harvester Co., Chicago, awarded the general contract for a parts depot in Broadview, Ill., to Ragnar Benson Inc., Chicago. Estimated cost is $8 million.

Illinois

Tuthill Spring Co., Chicago, is expected to award contracts soon for the erection of a factory addition to cost about $200,000.

Illinois

United States Atomic Energy Commission, Argonne National Laboratory, Downers Grove, Ill., has under consideration a low bid of $3,999,000 submitted by S. N. Nielson Co., Chicago, for the construction of a biology building.

Indiana

Ralston Purina Mills, St. Louis, awarded the contract for the designing and construction of and equipment for a soybean extraction plant in Lafayette, Ind., to the French Oil Mill Machinery Co., Piqua, O. Estimated cost is $400,000.

Iowa

Tolerton & Warfield Co., Sioux City, Iowa, awarded the general contract for a $900,000 warehouse building to H. S. Holtze Construction Co., that city.

Maryland

Black & Decker Mfg. Co., Towson, Md., maker of portable electric tools, plans to erect a 75,000-square foot addition to its main plant, work to be completed by spring. The company also has plans for a large branch plant of several hundred thousand square feet to be undertaken as soon as a satisfactory site is secured.

Maryland

Signode Steel Strapping Co., Chicago, is erecting an addition to its plant on North Point Road, Sparrows Point, Md.

Maryland

P. & H. Tool & Die Mfg. Co., 3801 Benson Ave., Baltimore, is building a manufacturing addition containing approximately 3000 square feet. Joseph F. Heinrichs and H. R. Pearse are partners in the company.

Massachusetts

Mills Engineering Co. Inc., Boston, was appointed to represent the Plate Products Division, **Fitzgibbons Boiler Co. Inc.,** New York, in New England.

Michigan

Murray Equipment Co., Detroit, signed distributorship agreement to handle **Worthington Pump & Machinery Corp.,** Harrison, N. J., multi-V drives and fractional horsepower belts and sheaves.

Minnesota

Cleco Division, **Reed Roller Bit Co.,** Houston, appointed Granite City Tool Co., St. Cloud, Minnesota, as distributor of Cleco pneumatic tools.

Presstite Engineering Co., St. Louis, awarded the general contract for the rebuilding of its plant that was partly

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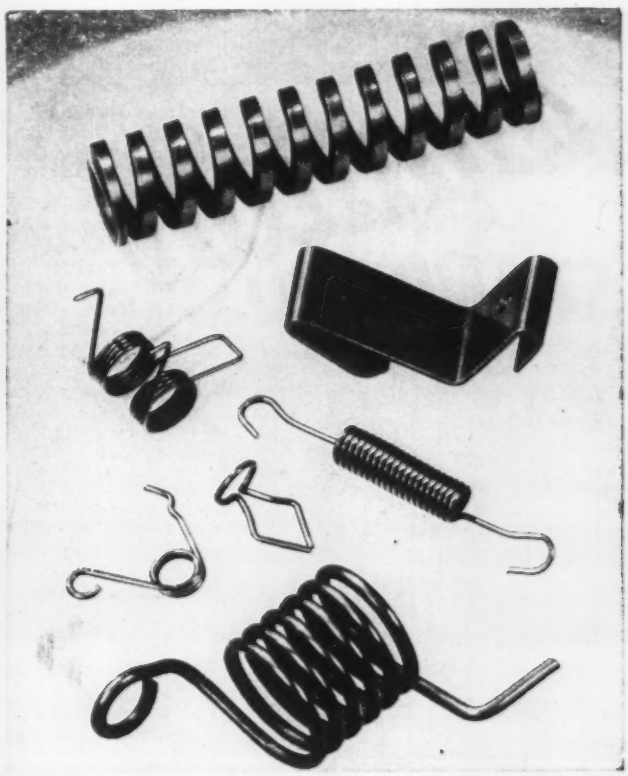

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